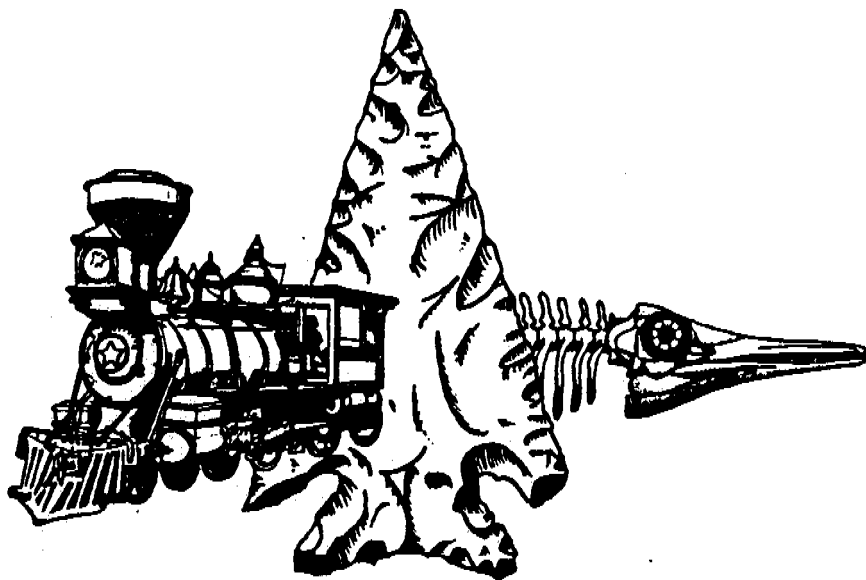


**BUREAU OF LAND MANAGEMENT  
NEVADA**



# **The Pony Express in Central Nevada**

**ARCHAEOLOGICAL AND  
DOCUMENTARY PERSPECTIVES**

**Donald L. Hardesty**

**CULTURAL RESOURCE SERIES    No. 1  
1979**



THE PONY EXPRESS IN CENTRAL NEVADA:  
ARCHAEOLOGICAL AND DOCUMENTARY PERSPECTIVES

by

Donald L. Hardesty

University of Nevada, Reno

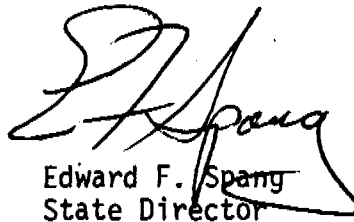
Nevada State Office  
Bureau of Land Management  
Reno, Nevada

1979

## FORWARD

The Pony Express project was initiated in 1976 through the Bureau's Cultural Resource Protection and Stabilization Program. The fieldwork and analysis was contracted to the University of Nevada, Reno, with Dr. Donald L. Hardesty project director. The project goals were designed to minimize impacts and enhance visitors' appreciation of these unique historical structures. Following the highly controlled excavation of the structures, the standing walls were reinforced to prevent further decay and walk-through fences were constructed to prevent harm to architectural features by vehicular traffic. The information gathered through the excavation effort is being incorporated into visitor interpretive developments following a Cultural Resource Management Plan developed by Carson City District.

The data recovered provides further information on a brief but fascinating period in Nevada's history which received little attention by writers of that time period. This Bureau publication initiates a new series in Nevada with the goal of providing an additional avenue for making newly acquired information of Nevada's cultural heritage accessible to the public and professional communities.



Edward F. Spang  
State Director

## ABSTRACT

There has been little archaeological research on the expansion of American civilization into the Great Basin; the present study helps to fill that void by examining the archaeological records of two pony express stations in central Nevada. The first part of the report presents the evidence for identifying the archaeological sites of Cold Springs and Sand Springs as the pony express stations with the same names documented in the written record. After concluding that the sites are, indeed, the same, the study examines the stations as archaeological sites formed through a series of natural and cultural processes. Both architectural evidence and stratigraphic deposits are considered. Artifacts left in the stations are next considered as clues to the human activities that once took place; the spatial arrangement of activities is studied, along with the possibility of identifying a distinctive "pony express station pattern" in the archaeological record. The report concludes with an analysis of faunal and floral remains, the use of soil chemical patterns to recognize human activity, and a discussion of the significance of the pony express station sites to historic preservation.

## PREFACE

The study of American civilization through its material remains is both a supplement and an alternative to exploring its history through written documents. Archaeology not only fills gaps left by the written word, and verifies, or refutes, the accuracy of historical statements, but also paints new pictures of the past. And because so many historic sites can be found on public lands, it is not surprising to find that the land managing agencies of the United States must provide for their proper management. Out of this obligation arises the archaeological studies of the 19th century pony express stations reported here.

What should go into such a report? The interest of the lay public, who are uninitiated into the mysteries of archaeological research, must always be kept in mind; for that reason, the report includes some descriptions of artifacts and other information that would be unnecessary for the professional archaeologist and as much jargon as possible has been deleted. But I have also tried to include the technical information desired by the professional. Fully detailed tabulations of artifacts and their proveniences have been left out, however, in the interests of space and monotony. The tabulations are available from the author and the Carson District, Nevada, Office of the Bureau of Land Management. Finally, the report includes recommendations for the future management of the archaeological sites; it is this information, of course, that is most important to the land

manager.

Innumerable people have helped with the preparation of this report. Dorothy Mason(Bureau of Land Management), Ron Reno(Nevada Department of Highways), Kathryn Totton(University of Nevada, Reno), Margaret Wheat, Walt Mulcahy, and Victor Goodwin were invaluable sources of information about the documentary record. Reb Bennett(Bureau of Land Management) and Richard Fike(Bureau of Land Management) helped with the bottle identification. Jonathan Davis(Nevada Archaeological Survey, University of Nevada, Reno) served as a geological consultant, Diana Gifford (University of California, Santa Cruz) identified the faunal remains, and Catherine Fowler(University of Nevada, Reno) identified the plant remains. Robert York(U.S. Forest Service), Nancy Botti(Bureau of Land Management), Richard Hanes(Bureau of Land Management), Helene Dunbar (Interagency Archaeological Services), and Brian Hatoff(Bureau of Land Management) assisted at various times with administrative details and for that I am grateful. My gratitude is also expressed to the many members of the archaeological crew involved in the project, especially to Steve Simms(University of Utah), David Watters(University of Pittsburgh), and Brad Logan(University of Kansas), who served as crew chiefs at various times. Finally, credit must be given to Barbara Taylor, who typed the preliminary site reports, and to Gail Curtis, who typed the final version.

DLH  
October, 1979

## CONTENTS

1	INTRODUCTION.....	1
2	ARCHAEOLOGICAL STUDIES AT COLD SPRINGS AND SAND SPRINGS STATIONS.....	5
	RESEARCH GOALS.....	8
	RESEARCH STRATEGY.....	8
3	SITE IDENTIFICATION: ARCHAEOLOGICAL AND HISTORICAL CLUES....	17
	GEOGRAPHICAL LOCATION.....	17
	PLACEMENT IN TIME.....	21
	ACTIVITIES.....	29
4	ARCHITECTURE.....	32
	SAND SPRINGS STATION.....	32
	Room 1.....	33
	Room 2.....	38
	Room 3.....	38
	Room 4.....	39
	Room 5.....	40
	Room 6.....	40
	Architectural History of Sand Springs Station.....	41
	COLD SPRINGS STATION.....	42
	Room 1.....	44
	Room 2.....	44
	Room 3.....	50
	Room 4.....	51
	Architectural History of Cold Springs Station.....	51

5	FORMATION OF THE ARCHAEOLOGICAL RECORD.....	58
	SAND SPRINGS STATION.....	59
	Room 1.....	61
	Room 2.....	63
	Room 3.....	66
	Room 4.....	67
	Room 5.....	69
	Room 6.....	69
	Outside.....	72
	COLD SPRINGS STATION.....	75
	Room 1.....	76
	Room 2.....	79
	Room 3.....	82
	Outside.....	83
6	A TRASHY EXPOSE OF LIFE IN A PONY EXPRESS STATION.....	84
	HOUSEHOLD ACTIVITIES.....	85
	PERSONAL ACTIVITIES.....	97
	COMMUNICATIONS.....	112
	WEAPONS.....	113
	LIVERY ACTIVITIES.....	117
	ARCHITECTURE AND CONSTRUCTION.....	118
	THE PONY EXPRESS PATTERN.....	119
	THE SPATIAL ORGANIZATION OF BEHAVIOR.....	122
	THE RECOGNITION OF ACTIVITIES THROUGH THE ARCHAEOLOGICAL RECORD.....	123

	Artifact Ratios and Percentages .....	124
	Artifact Diversity .....	129
	Intensity of Deposition .....	129
	Soil Chemistry .....	135
	ACTIVITY PATTERNS AT COLD SPRINGS .....	142
	Room 1 .....	142
	Room 2 .....	143
	Room 3 .....	144
	Room 4 .....	145
	Outside .....	145
	ACTIVITY PATTERNS AT SAND SPRINGS .....	145
	Room 1 .....	146
	Room 6 .....	147
	Room 2 .....	147
	Room 3 .....	148
	Room 4 .....	148
	Room 5 .....	149
	Outside .....	149
7	DIETARY PATTERNS .....	151
	FAUNAL REMAINS.....	152
	The Menu.....	153
	Butchering/Refuse Disposal Patterns.....	156
	PLANT REMAINS.....	161
8	ASSESSING SIGNIFICANCE.....	164
	SIGNIFICANCE TO THE LAY PUBLIC.. ...	164

ARCHAEOLOGICAL SIGNIFICANCE.....	166
LITERATURE CITED.....	171

## FIGURES

1	FLOOR PLAN OF THE SAND SPRINGS STATION.....	34
2	ELEVATION OF NORTH OUTSIDE WALL AT SAND SPRINGS STATION.....	35
3	ELEVATION OF INTERIOR WALL SEPARATING RESIDENTIAL ROOMS (ROOMS 1, 3, and 6) FROM THE FOYER AND STABLE (ROOMS 2 and 5) AT SAND SPRINGS STATION.....	36
4	ELEVATION OF EAST OUTSIDE WALL AT SAND SPRINGS STATION.....	36
5	ELEVATION OF WEST OUTSIDE WALL AT SAND SPRINGS STATION.....	36
6	FLOOR PLAN OF THE COLD SPRINGS STATION.....	43
7	ELEVATIONS OF ROOM 1 AT COLD SPRINGS STATION.....	45
8	ELEVATIONS OF ROOM 2 AT COLD SPRINGS STATION.....	46
9	ELEVATIONS OF ROOM 3 AT COLD SPRINGS STATION.....	47
10	ELEVATIONS OF ROOM 4 AT COLD SPRINGS STATION.....	48
11	STRATIGRAPHIC PROFILES OF ROOM 1 AT SAND SPRINGS STATION.....	62
12	STRATIGRAPHIC PROFILES OF ROOMS 2 AND 3 AT SAND SPRINGS STATION..	64
13	STRATIGRAPHIC PROFILES OF ROOM 4 AT SAND SPRINGS STATION.....	68
14	STRATIGRAPHIC PROFILES OF ROOMS 5 AND 6 AT SAND SPRINGS STATION..	70
15	STRATIGRAPHIC PROFILES OUTSIDE SAND SPRINGS STATION.....	73
16	STRATIGRAPHIC PROFILES OF ROOMS 1, 2, AND 3 AT COLD SPRINGS STATION	77
17	EAST-WEST STRATIGRAPHIC PROFILE OF ROOM 2 AT COLD SPRINGS STATION	80
18	ARTIFACT PATTERNS FROM COLD SPRINGS AND SAND SPRINGS STATIONS AND NEIGHBORING SITES ILLUSTRATED WITH CUMULATIVE FREQUENCY CURVES.	121
19	ROOM ARTIFACT PATTERNS FROM COLD SPRINGS STATION ILLUSTRATED WITH CUMULATIVE FREQUENCY CURVES.....	127
20	ROOM ARTIFACT PATTERNS FROM SAND SPRINGS STATIONS ILLUSTRATED WITH CUMULATIVE FREQUENCY CURVES.....	128

# TABLES

1	DOCUMENTARY SOURCES USED FOR THE STUDY.....	10
2	PERCENTAGE OF LIVING FLOOR EXCAVATED.....	12
3	TIME RANGE OF ARTIFACTS FROM COLD SPRINGS AND SAND SPRINGS.....	23
4	GLASS "FINGERPRINTS" OF THE PONY EXPRESS STATIONS.....	25
5	NAIL MANUFACTURING METHODS REPRESENTED AT COLD SPRINGS.....	27
6	WEAPONS TECHNOLOGY REPRESENTED AT COLD SPRINGS AND SAND SPRINGS	28
7	ARCHAEOLOGICAL EVIDENCE OF HUMAN ACTIVITIES.....	31
8	FUNCTIONAL AND STYLISTIC CLASSIFICATION OF ARTIFACTS FROM SAND SPRINGS AND COLD SPRINGS.....	86
9	BUTTONS AND THEIR CLASSIFICATION.....	99
10	SPATIAL DISTRIBUTION OF ARTIFACT CLASSES AND PERCENTAGES AT SAND SPRINGS STATION.....	125
11	SPATIAL DISTRIBUTION OF ARTIFACT CLASSES AND PERCENTAGES AT COLD SPRINGS STATION.....	126
12	SPATIAL DISTRIBUTION OF ARTIFACT RATIOS AT SAND SPRINGS.....	130
13	SPATIAL DISTRIBUTION OF ARTIFACT RATIOS AT COLD SPRINGS.....	131
14	OCCURRENCE OF ARTIFACT CATEGORIES AT SAND SPRINGS.....	132
15	OCCURRENCE OF ARTIFACT CATEGORIES AT COLD SPRINGS.....	134
16	INTENSITY OF DEPOSITION AT SAND SPRINGS.....	136
17	INTENSITY OF DEPOSITION AT COLD SPRINGS.....	137
18	SOIL CHEMICAL ANALYSIS: SAND SPRINGS.....	138
19	SOIL CHEMICAL ANALYSIS: COLD SPRINGS.....	141
20	FAUNAL INVENTORY AT SAND SPRINGS.....	154
21	FAUNAL INVENTORY AT COLD SPRINGS.....	155
22	NUMBER OF ELEMENTS PER TAXON (SAND SPRINGS STATION).....	158
23	PLANT REMAINS FROM SAND SPRINGS STATION.....	162

## PLATES

1	COLD SPRINGS STATION.....	14
2	SAND SPRINGS STATION: STEP-TRENCHING.....	15
3	SAND SPRINGS STATION: EMERGING FROM THE DUNE.....	16
4	FIREPLACE IN ROOM 1 AT COLD SPRINGS STATION.....	49
5	REBUILDING OF WALL SEPARATING ROOMS 2 AND 3 AT COLD SPRINGS STATION.....	54

## MAPS

- 1 COLD SPRINGS HISTORIC AREA.....6
- 2 LOCATION OF THE SAND SPRINGS SITE.....7



## INTRODUCTION

American civilization in the 19th century was rapidly expanding out of its heartland into the western United States, a movement that was linked to the discovery of gold in California in 1848 and silver in Nevada in 1859. The expansion of any civilization into a new land brings with it problems of communications and supply, and America was no exception. In response the federal government financed explorations and surveys intended to find fast overland routes between the east and the west. Perhaps the most successful of these was led by Captain James H. Simpson of the U.S. Corps of Topographical Engineers, who found a direct route across the Great Basin that was some 150 miles shorter than any previously known (Simpson 1876). The government also awarded mail contracts to private organizations with the intent of establishing a fast and regular line of communication between the heartland and the expanding frontier. Major George Chorpenning was the earliest to secure government mail contracts in the Great Basin, continuing throughout the 1850's (Chorpenning 1874). The faster Simpson's route was adopted by Chorpenning in 1859 (Territorial Enterprise, December 31, 1859; Chorpenning 1874: 23-24); unfortunately, he lost his mail contract to the firm of Russell, Majors, and Waddell.

William H. Russell, the senior partner in the firm, which operated a passenger and freight stage route between the Missouri

River and Salt Lake City, had been convinced by Senator Gwin of California to start a new, high speed "pony express" across the western frontier. Starting in Saint Joseph, Missouri, the route continued across the plains to Salt Lake City, then across the Great Basin by way of Simpson's route to Sacramento, California. Messrs. Russell, Majors, and Waddell put together a logistics network to support the pony express, including 190 way stations, 500 horses, and 80 riders (Majors 1893). Announcements for the service appeared in March 1860, and the first run began on April 3 of the same year from Saint Joseph. The pony express venture was very successful as a demonstration of the feasibility of using the central overland route as a fast and regular communications link between the east and the west; however, it was a financial disaster. Never subsidized by the the federal government, the company went bankrupt shortly after the pony express was discontinued on October 24, 1861. The pony express was successful in showing the feasibility of the central overland route for rapid cross-country transportation. Indeed, the central route replaced the southern Butterfield route, which now transgressed the confederacy and was a liability to the Union. But the need for a pony-borne messenger service between the east and the west was negated by the completion of the transcontinental telegraph in the fall of 1861. The service was discontinued on October 24, 1861, and the company, never subsidized by the federal government for the financially disastrous operation, went bankrupt shortly

thereafter.

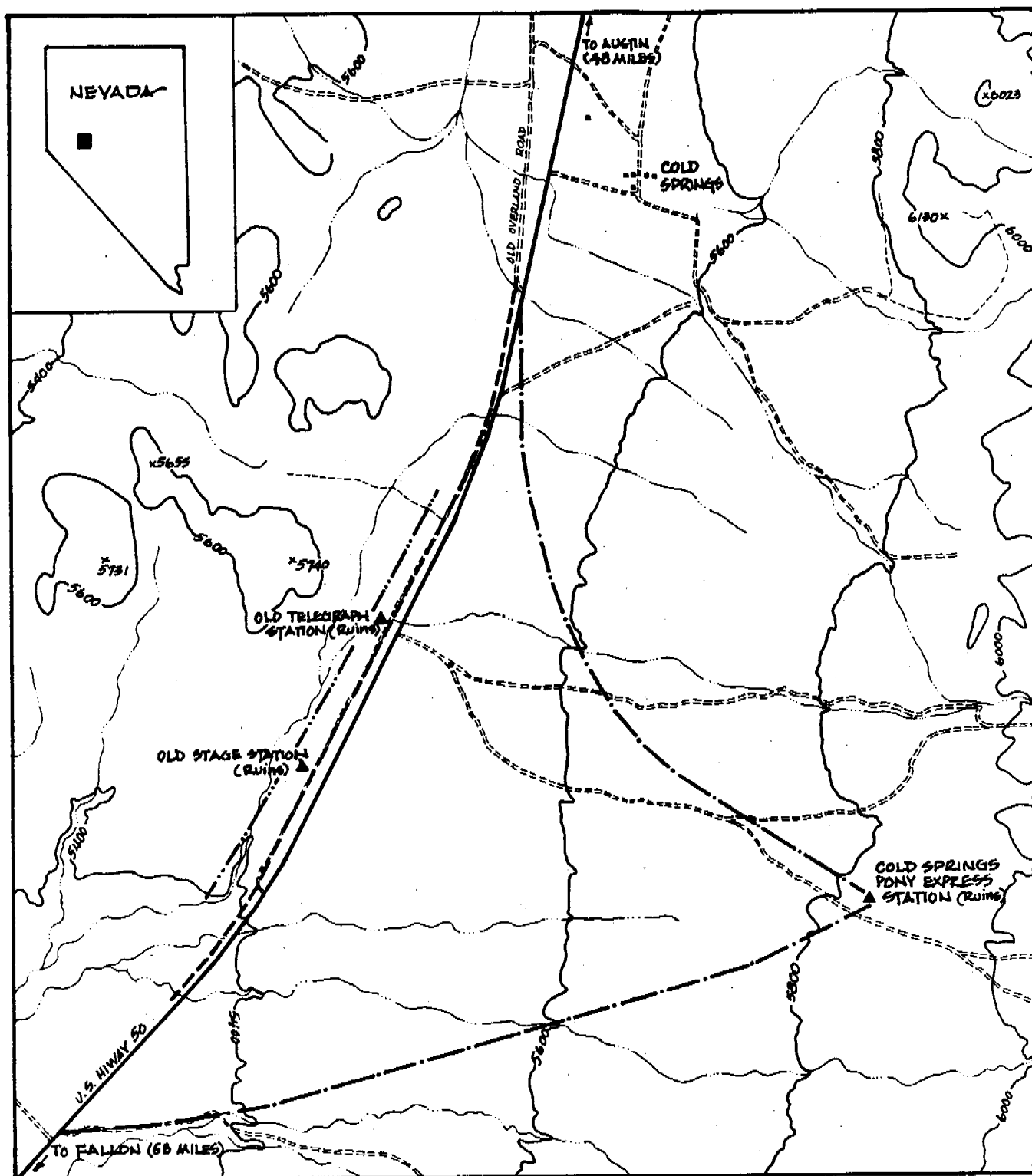
The saga of the pony express has become such a part of the American West that no text of American history is complete without it. "Buffalo Bill" Cody and "Pony Bob" Haslam are as well known to the grammar school student as Andrew Carnegie or Samuel F.B. Morse. Tomes have been filled with its legend, and its role in the expansion of American civilization into the West is chronicled (e.g., Hafen 1926). Yet very little is known about the day to day life of the actors. Some documents give us a glimpse, to be sure, and the observations of Sir Richard Burton (1862) and the reminiscences of the actors themselves (e.g., Majors 1893) are invaluable. The mundane, however, is either not remembered or is deemed unimportant, so it is not written and is forgotten forever. Where can such information be found? The archaeological record. People leave behind garbage and other material evidence of their activities and the participants in the pony express drama were no exception. These remains are a source of verification of historical statements that is independent of documentary sources. The most fundamental assumption of archaeological research is that human behavior is patterned and is sometimes reflected in the form and arrangement of artifacts and other materials in the archaeological record that is, artifact patterns are the key to understanding past human behavior. In a most general way, that is no more than common sense; the garbage left behind in an old blacksmith shop is going to be different

from that in somebody's kitchen or living room. The problem is that the pattern of a particular human activity is not so easy to identify. People seldom just drop things where they were used, contrary to wishes and hopes of all archaeologists. Some things are, in fact, "trampled" underfoot but others are tossed outside or carried to a dump; some things are treasured and seldom, if at all, find their way into the archaeological record but others have little value and are thrown away readily, overrepresenting their importance; "small" things tend to be trampled into the ground close to where they were originally used but "large" things are kicked aside or carried away from their original place of use; and so forth. All of these disturbances make it difficult to recognize a pattern that could be used to identify and reconstruct ancient or not so ancient human activities, and problems of differential preservation and natural disturbances make it even more difficult. Consequently, mistakes of identification are easily made: garbage can be deceiving. (v. Schiffer 1976 for a useful but technical discussion of the problems in relating the archaeological record to human behavior.) Verifying the truth, then, is no less a problem for archaeology than for history and strongly suggests that the data of both disciplines must be combined whenever possible to give the most accurate and detailed statements possible.

## ARCHAEOLOGICAL STUDIES AT COLD SPRINGS AND SAND SPRINGS STATIONS

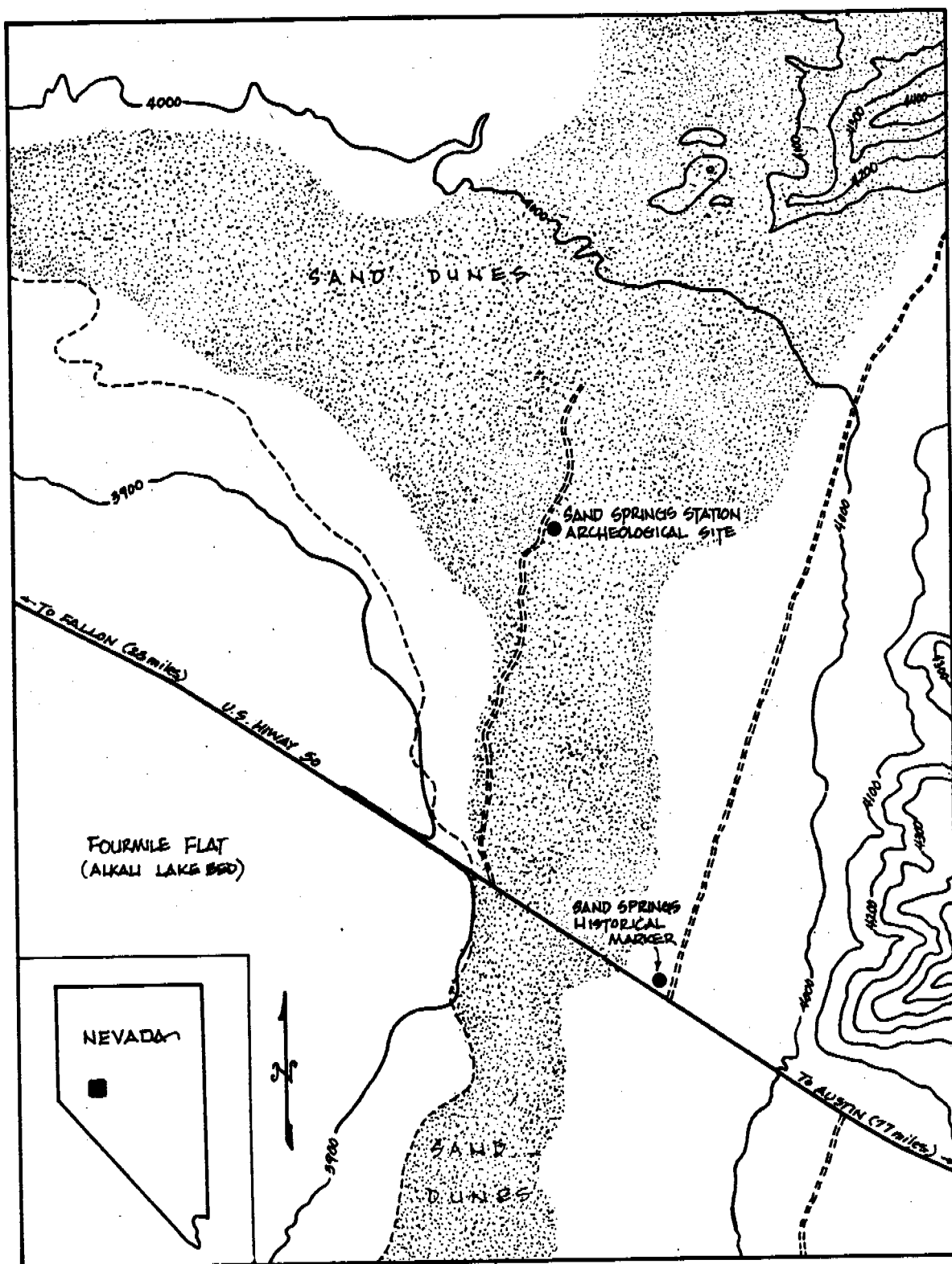
Not many pony express stations have survived the ravages of time, preventing a study of their archaeological records; however, a few still remain to give tantalizing glimpses of their past: Cold Springs station and Sand Springs station in northcentral Nevada are two of these (Maps 1,2) Both are on land managed by the Carson District of the Bureau of Land Management and came under archaeological scrutiny for entirely different reasons. Cold Springs has been known for some time as perhaps the best preserved pony express station in Nevada. And after the BLM had chosen to celebrate the American Bicentennial with a pony express theme, the station became the logical choice for exhibition. Accordingly, the University of Nevada, Reno, was engaged to do archaeological research at Cold Springs to mitigate the impact of visitors, to make recommendations about how the building should be stabilized and preserved, and to provide more detailed information about the history of the building and the day to day activities of its occupants. The fieldwork for the project was completed during May 1976.

Sand Springs station was, however, excavated for purposes of site identification and protection with only vague suspicions that it might be a pony express station. It emerged as a desert phoenix. Personnel from the Carson District of the BLM discovered the site in danger of destruction not far from the Sand Mountain recreation area; offroad recreational vehicles were running over



- ▲ HISTORIC RUINS
- PONY EXPRESS TRAIL
- STAGE ROUTE
- TELEGRAPH ROUTE

Map 1. COLD SPRINGS HISTORIC AREA (U. S. Geological Survey 7.5' Quadrangle Cold Springs, Nevada. Contour Interval 200 Feet: 1 inch = 2000 Feet.)



Map 2. LOCATION OF THE SAND SPRINGS SITE (CrNV 03-06) (U. S. Geological Survey 7.5' Quadrangle Fourmile Flat, Nevada. Contour Interval 20 Feet: 1 inch = 2000 Feet.)

top of what appeared to be the low stone foundation of a moderate size building. Refuse in the vicinity of the building suggested a mid-19 century occupation and a problem: the only mid-19th century site in the area was supposed to be the Sand Springs pony express and stage station and that was traditionally located in the turn of the century mining town of Sand Springs about a mile away. What could this building be? To answer that question and to protect the site from ORV's and other visitors, the University of Nevada, Reno, was again engaged to do archaeological studies. The fieldwork was completed during July and December 1976.

#### RESEARCH GOALS

The goals of the archaeological studies at Cold Springs station and at Sand Springs station are, then, threefold. One is to verify the historical identities of the two sites, not only Sand Springs, which was an unknown at the time of the study, but also to provide additional evidence that the site identified as the Cold Springs pony express station was indeed the one described in documentary sources. Second, the archaeological record of the two sites is to be used to reconstruct the details of their history and the lifestyles of their occupants. Finally, the purpose of the research is to make recommendations to the Bureau of Land Management about the future management and protection of the buildings.

#### RESEARCH STRATEGY

A search of the documentary record was the first step used to

accomplish the goals set for the project. Primary documentary sources were used as often as possible, supplemented where necessary by secondary sources. The primary sources consulted for this report are deposited in the following places: the Bancroft Library, University of California, Berkeley; the western Americana collection, University of Utah Library; the Utah State Historical Society; the Nevada Historical Society; Getchell Library, University of Nevada, Reno, Library; and the Bureau of Land Management Nevada state office in Reno. Table 1 lists the principal documents used. Mrs. Kathryn Totton and Mr. Ron Reno, both graduate students in the Department of History, University of Nevada, Reno, assisted in the study of documentary record.

The documentary record, and oral interviews with persons familiar with the area at the turn of the century, allowed the formulation of a set of hypotheses about the arrangement of activities and other characteristics of pony express stations in central Nevada. These hypotheses were then tested, and others created, with observations from the archaeological record, the second stage in the research strategy. The methods used to recover archaeological data included the mapping of artifacts found in situ, the collection of all artifacts found on the surface within the buildings and within a ten-meter wide zone around the building, and excavation. Archaeological data were recorded with the operation-lot system used by the National Historic Sites Service of Canada (Swannack 1973). The site was first divided into operations, areas with

TABLE 1. DOCUMENTARY SOURCES USED FOR THE STUDY

SECONDARY SOURCES

- Angel, Myron, editor, History of Nevada 1881 with illustrations and Biographical Sketches of its Prominent Men and Pioneers, Oakland, California: Thompson and West, 1881; reprint edition, Berkeley, California: Howell-North, 1958.
- Burton, Richard F., The City of the Saints, and Across the Rocky Mountains to California, New York: Harper and Brothers, 1862.
- Chapman, Arthur, The Pony Express: The Record of a Romantic Adventure in Business. New York & London: G.P. Putnam's Sons, 1932.
- Conkling, Roscoe P. and Margaret B. Conkling. The Butterfield Overland Mail 1857-1869. 2 vols. Glendale, California: The Arthur H. Clark Company, 1947.
- Elliott, Russell R. History of Nevada. Lincoln: University of Nebraska Press, 1971.
- Hafen, Leroy, Overland Mail 1849-1869. A.H. Clark Company, Cleveland, 1926.
- Majors, Alexander, Seventy Years on the Frontier. Chicago & New York: Rand, Mc Nally & Company, 1893.
- Settle, R.W. and M.L. Settle, Saddles and Spurs, the Pony Express Saga, Harrisburg, Penn.: The Stackpole Company, 1955.
- Simpson, J.H., Report of Explorations across the Great Basin of the Territory of Utah, Engineer Department, U.S. Army, Washington, D.C.: Government Printing Office, 1876.
- Smith, Waddell F., ed. The Story of the Pony Express. San Francisco: Hesperian House, 1960.
- Thompson, Robert L. Wiring A Continent: The History of the Telegraph Industry in the United States 1832-1866. Princeton, New Jersey: Princeton University Press, 1947.
- Wheat, Carl I. 1540-1861 Mapping the Transmississippi West. 5 vols. San Francisco: The Institute of Historical Cartography, 1963.

## PRIMARY SOURCES

### Newspapers

Como Sentinel (Lyon County Sentinel). Como (Dayton), Nevada.

Fairview News. Fairview, Nevada.

Fallon Standard. Fallon, Nevada.

Lyon County Times. Silver City, Nevada.

Reese River Reveille. Austin, Nevada.

Territorial Enterprise. Genoa (to November 1859), Carson City (to October 1860), Virginia City, Nevada.

Virginia Evening Bulletin. Virginia City, Nevada.

Washoe Times. Washoe City, Nevada.

The Deseret News, Salt Lake City, Utah.

### Periodicals and Diaries

Ajax, William, Diary, Manuscript on file in the University of Utah Library, Salt Lake City, n.d.

Bender, Flora Isabella. "Memoranda of a Journey Across the Plains, from Bell Creek, Washinton Co., Neb. to Virginia City, Nev., Terr. May 7 to August 4, 1863." Nevada Historical Society Quarterly 1 (July 1958): 145-173.

Chorpenning, George, The Case of George Chorpenning vs the United States: A Brief History of the Facts by the Claimant, with Arguments of Counsel, Washington, D.C.: M'Gill and Witherow, 1874.

Lee, William, Overland Journey from Washington, D.C. to Genoa, Carson Valley, Utah and Return, with Captain J.H. Simpson, Manuscript on file in the Utah State Historical Society, Salt Lake City, 1859.

Roberson, Joseph, Extracts from Articles written on the Pony Express, Manuscript on file at the Bancroft Library, University of California, Berkeley, n.d.

Rumfield, Hiram S., Letters of an Overland Mail Agent in Utah (edited by A.B. Hulbert), Proceedings of the American Antiquarian Society for October 1928, 1929.

distinct cultural or natural boundaries that are suspected to have archaeological significance, such as rooms in a building. Each operation was then gridded into metric units, or sub-operations, that could be used to control the collection of surface artifacts and the excavation. Sub-Operations were, in turn, divided into minimal collection units, or lots, ranging from isolated artifacts to stratigraphic units.

The purpose of excavation was: (1) to collect a representative sample of the archaeological record, (2) to leave enough of the record intact that it could be used for future research. Table 2 shows the percentage of the living floor excavated for each of the rooms in the two stations. At Cold Springs a sample size of fifteen percent was selected but was increased at Sand Springs to improve reliability. Simple random sampling was used to select excavation units in large rooms, while systematic sampling was used for the same purpose in smaller operations. One or two meter square excavation units were used in all cases.

TABLE 2. PERCENTAGE OF LIVING FLOOR EXCAVATED

	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6
Sand Springs	50.0	40.0	33.3	3.6	13.3	41.7
Cold Springs	16.5	14.9	15.5	0.0	----	----

All of the excavated deposits were screened through 1/4-inch wire mesh to assure the reliable recovery of artifacts and other refuse not located in situ. Bone and other non-artifactual data

were also collected. Flotation procedures were not used, but samples were checked with particle sorting screens to make sure that no categories of archaeological data were being systematically lost.

Cold Springs was a surface site (Plate I) but Sand Springs was covered with a 6-feet high sand dune. In order to get down to the original living floor, the dune was removed with a combination of step-trenching and mechanical equipment. Step-trenching was used in the beginning to establish control over the natural and cultural stratigraphy that might exist in the dune (Plate 2). Two 6-meter wide trenches were excavated, one starting at the south end of the dune and the other starting at the west end. Thirty (30) centimeter arbitrary levels were used for vertical control. The excavated deposits were initially screened through a  $\frac{1}{4}$  inch mesh to recover artifacts; however, the procedure was abandoned after it became apparent that the dune was culturally sterile. A refuse zone was encountered in both trenches, inside and outside the station, about 6 feet below the highest part of the dune. Occasional artifacts and faunal remains occurred in a zone extending upward about 1 foot from the zone. Several additional control trenches and pits elsewhere in the dune confirmed identical stratigraphic relationship; consequently, mechanical equipment was brought in to remove the dune to within a foot of the refuse zone. A back-hoe was used to excavate the sand overburden within each of the

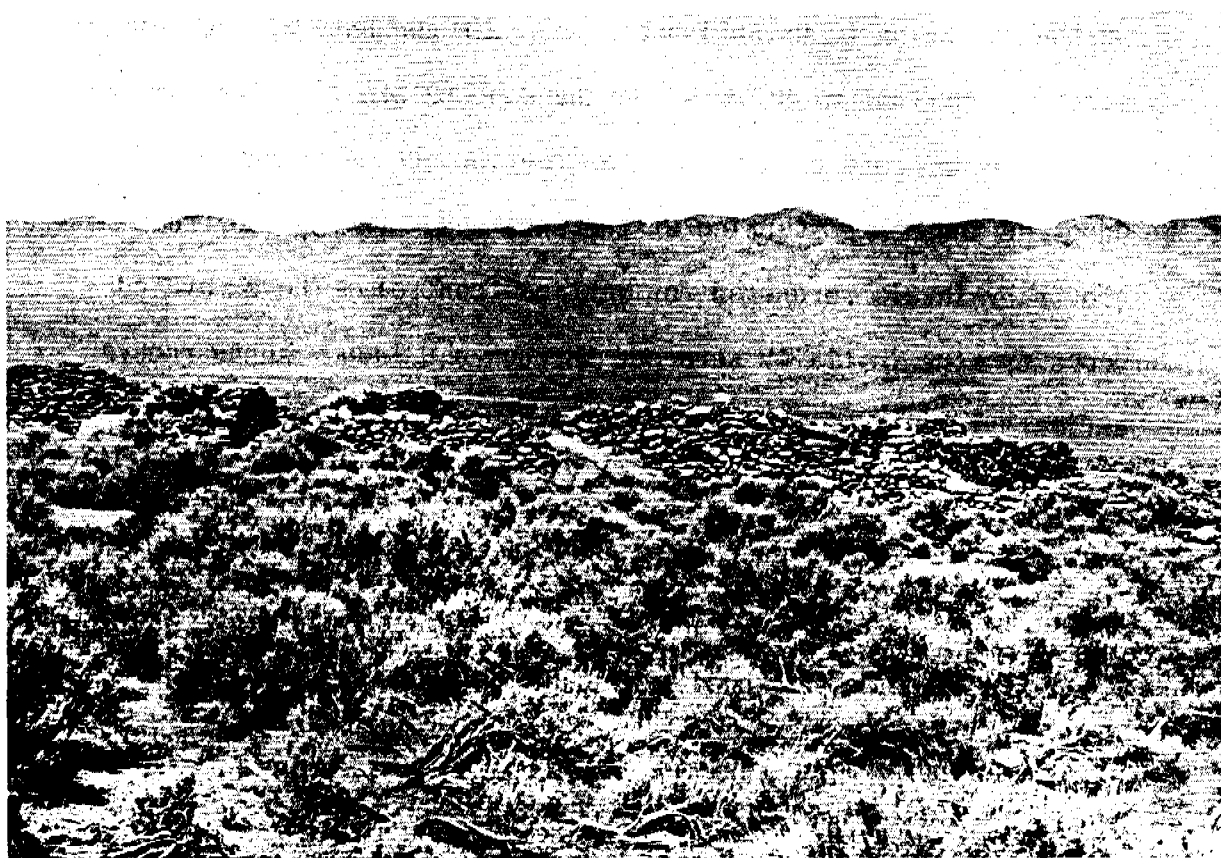


PLATE 1. COLD SPRINGS STATION



PLATE 2. SAND SPRINGS STATION: STEP-TRENCHING. SAND MOUNTAIN CAN BE SEEN IN THE UPPER RIGHTHAND CORNER.

six rooms that had been located and to pull sand away from the outside wall; a bulldozer completed the job by pushing the excavated overburden away from the station and its immediate environs (Plate 3).

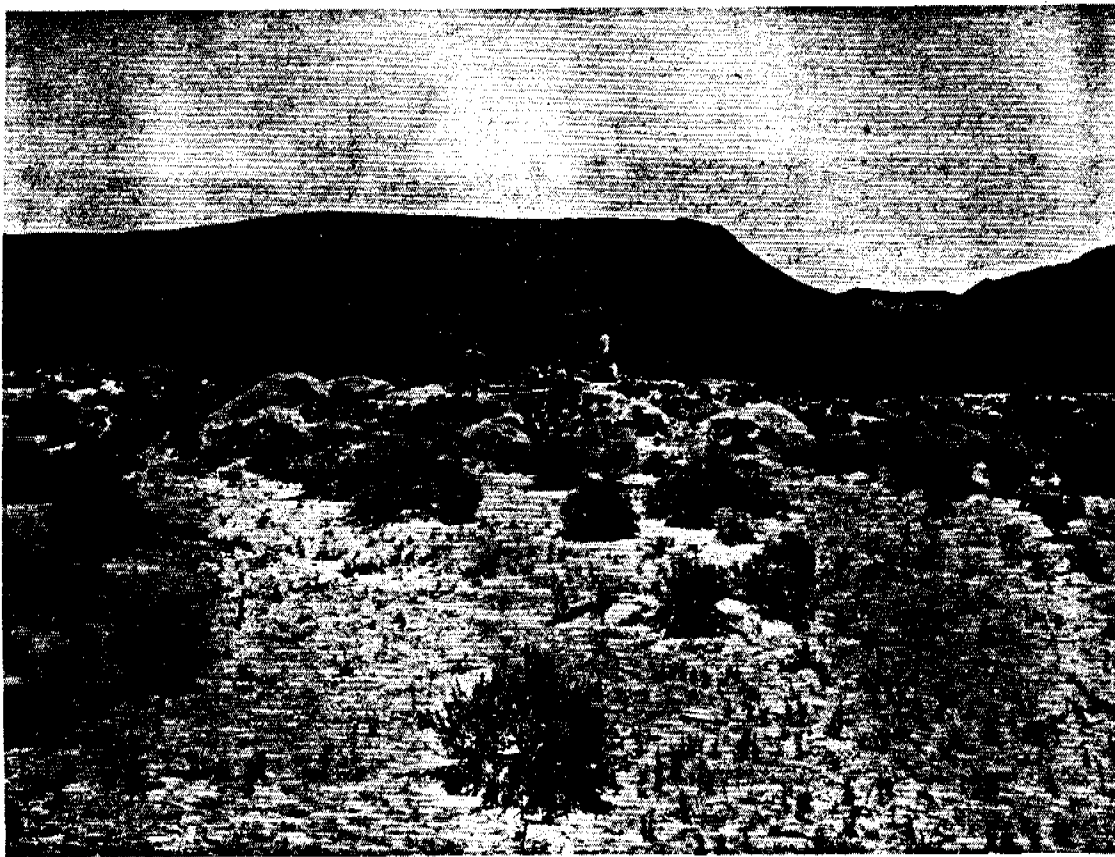


PLATE 3. SANDS SPRINGS STATION: EMERGING FROM THE DUNE

## SITE IDENTIFICATION: ARCHAEOLOGICAL AND HISTORICAL CLUES

The first goal of the project was to verify that the archaeological sites identified as the Cold Springs and Sand Springs pony express stations are the same as those mentioned in historical documents. Several kinds of questions are relevant. Perhaps most important are the congruencies between the documented geographical location of the pony express stations and those of the archaeological sites, followed closely by similarity in time placement. Dating of archaeological remains is especially important because of the existence of other historic sites in the same geographical area. Third, we can look for similarities in human activities expected in pony express stations and those inferred from the archaeological records of the two sites being studied. That is based upon the assumption, noted in the introduction, that the artifacts discarded, lost, or abandoned by humans engaged in those activities required to operate a pony express station will be different from those left by humans engaged in farming, mining, or other kinds of activities.

### GEOGRAPHICAL LOCATION

Neither Sand Springs nor Cold Springs stations can be precisely located from documentary sources; however, the general area is suggested. J.G. Kelley, an assistant station keeper at Cold Springs station and later a pony express rider, is quoted as follows:

Arriving at the sink of the Carson River, we began the

erection of a fort to protect us from the Indians...We next built a fort of stone at Sand Springs, twenty five miles from Carson Lake and another at Cold Springs, thirty seven miles east of Sand Springs. (Majors 1893: 188-189)

We know that the two archaeological sites are generally situated in the same place. If a more exact geographical position is to be found, however, the stations will have to be located in terms of landscape features that can still be recognized today. The British explorer Sir Richard Burton visited many of the pony express stations on the American frontier during a trip to the New World in 1860. His observations, recorded in The City of the Saints (1862), include some details about the geography of Sand Springs and Cold Springs. Burton visited Cold Springs during the night of October 14-15, 1860 and noted that the station was built alongside a mountain stream with good water.

The station was a wretched place, half built and wholly unroofed; the four boys, an exceedingly rough set, ate standing, and neither paper nor pencil was known amongst them. Our animals, however, found good water in a rivulet from the neighboring hills, and the promise of a plentiful feed on the morrow...(Burton 1862:487)

Somewhat earlier Captain James Simpson, on his return trip east from Genoa, Utah Territory, established a camp (#7) on July 1, 1859 with the name of Cold Springs in what appears to be an identical position. He also notes the excellent water:

Ten miles from Middle Gate reach, near the base of Se-day-e Mountain, a small running brook of icy-cold, pure water, which I call Cold Spring, and which, after running a few hundred yards, sinks. (Simpson 1876:106)

The archaeological site named Cold Springs is situated alongside a small mountain creek that continues to have a perennial flow of good water; furthermore, the site is very close to the elevation given for Camp #7 by Simpson as 5570 feet (ibid.). With the collapse of the pony express operation and its subsequent purchase by the Overland Mail Company, Cold Springs station continued in name but was apparently moved by 1863. A diary kept by Flora Isabella Bender, one of a party of emigrants, records a stop at Cold Springs in that year:

Started out early this morning and passed several nice ranches before getting out on the desert. No water till we got to Cold Springs where we nooned--poor water. Proceeded on and arrived at dark at West Gate,.....(Bender 1958: 171)

"Poor water!" The Cold Springs visited by Simpson and Burton, was noteworthy for its good water, but poor water is found at Rock Creek station, on the valley floor about a mile and a half east of the Cold Springs site (v. Hardesty 1978a). Rock Creek is also traditionally identified as the Cold Springs station (Walt Mulcahy, personal communication), and with good reason! It was the Cold Springs Overland Mail Station, but it was not the

Cold Springs pony express station.

A similar problem of identification plagues Sand Springs station. Sir Richard Burton stopped at Sand Springs early in the morning on October 17, 1860. He vividly describes the most prominent feature of the landscape:

Sand-Springs deserved its name. Like the Brazas de San Diego and other mauvaises terres near the Rio Grande, the land is cumbered here and there with drifted ridges of the finest sand, sometimes 200 feet high and shifting before every gale. Behind the house stood a mound shaped like the contents of an hour-glass, drifted up by the stormy S.E. gale in esplanade shape and falling steep to northward or against the wind. (Burton 1862:491)

The only part of the present landscape that even remotely resembles that hour-glass sand dune is Sand Mountain, about a mile to the east of the archaeological site we are calling Sand Springs and easily visible from there (Plate 2). Capt. Simpson did not assign the place name "Sand Springs" to one of his camps, but it is clear that he did camp in the vicinity of the site. William Lee, one of Simpson's chronometer-keepers and meteorological assistants gives the following description of the landscape around Camp 30, situated in what they called "Alkaline Valley," between Middle Gate and Carson Lake:

Marched 25 and 1/10 miles, and camped on some wells dug

by Reese and his partners, who went on ahead to find water.

A very hard road for the mules today - very heavy sand.

Near where we camped there is a large hill about 1000 feet high and perfectly bare - not a shrub or stone on it, all sand.....(Lee 1859)

That "hill" must be Sand Mountain. Oral history provides some additional support for the identification. Two local residents, Mr. Mark Lattin and Mr. Robert Barkley, recall that the archaeological site was known as the Sand Springs pony express station during the early part of this century, although that fact has been lost to the memory of most present residents. Mr. Lattin first saw the station in 1907, and it was clearly visible; Mr. Barkley remembered that the building was completely covered with sand by 1927, except for one corner. About 1908 or 1909, according to Mr. Lattin, two prospectors built a lean-to at the station, repaired the corrals for their two oxen and two burros and transported ore from a claim to the well at Sand Springs. Mr. Barkley also remembers that the road to the town of Sand Springs during the early 20th century was seasonal, with the direct route across Fourmile Flat open only during the summer. The wet weather road skirted the flat and ran by the old pony express station.

#### PLACEMENT IN TIME

If the two archaeological sites are the Cold Springs and Sand Springs pony express stations, then their deposits should

date to the mid-19th century. More precisely, the documentary record suggests that Cold Springs was occupied from 1860 to 1863 and Sand Springs from 1860 to the 1870's with a short period of occupation in the early twentieth century. Archaeological evidence of this time span for the deposits would support our identification. Unfortunately, the precise dating of 19th century sites in the American West is risky. The detailed ceramic chronologies that have been worked out for the 17th and 18th centuries in the eastern United States cannot be used, simply because of the great popularity and continued use right up to the present of a single ceramic ware-whiteware/ironstone. Thus, the mean ceramic data formula, developed by Stanley South (1972, 1977) and widely used, is not appropriate for mid 19th century and later sites because it demands several ceramic types, each of which has a unimodal popularity curve and which have somewhat different time spans. Whiteware-ironstone pottery is ubiquitous on western historic sites, making ceramic analysis a less than useful tool for dating purposes. Pottery that has a maker's mark, on the other hand, can be used to estimate the time placement of 19th century archaeological sites if a date is included or if the period during which the manufacturer made that pottery can be found. Of course, there may be a time "lag" between the time of manufacture and the time of deposition through discard, loss, or abandonment (v. Schiffer 1976). A reasonably large number of independent determinations will,

however, minimize any dating discrepancies that might exist because of lag. Table 3 shows the time span of several artifacts from the archaeological deposits at Cold Springs and Sand Springs that could be dated.

TABLE 3  
TIME RANGE OF ARTIFACTS IN COLD SPRINGS AND SAND SPRINGS  
COLLECTIONS

<u>Artifact</u>	<u>Time Range</u>	<u>Cold Springs</u>	<u>Sand Springs</u>
Peppersauce Bottle	- 1880	X	X
Barrel Mustard Bottle	- 1900	X	X
F. Brown's Ess of Jamaica Ginger	1860 - 1900		X
Hunnewell Spice Bottle	1860 - 1900	X	X
Catawba Wine Bitters Bottle	1860 - 1866		X
Davis Vegetable Pain Killer	1850s- 1900		X
Merchant's Gargling Oil Liniment	1840 - 1900		X
London Jockey Clubhouse Gin	1850s- 1870s		X
"Black Glass" Bottle Fragments	1870s	X	X
Applied Lip	- 1880	X	X
Potter's Mark, W. Davenport and Company, Longport, England	1860		X
Potter's Mark, William Adams, Tunstall, England	1896 -		X
Umbrella Ink Bottle	- 1860s	X	
Pewter Spoon, Charles Parker and Company, Meriden, Conn.	1850 -		X
Vulcanite Buttons, Goodyear's patent "May 6, 1851"	1851 -		X
Cut Nails	1850 - 1888	X	
Open-top cans	1833 - 1900s	X	
Hole-in-the-top cans	mid 1800's	X	

Pottery with dateable maker's marks are included.

If ceramics have been a boon to dating 18th century sites, glass bottles may ultimately be the key to dating 19th century sites. Bottles are not only the most abundant artifact category on most sites of this period, but also have a lot of formal variability (color, shape, etc.) that can be tied to temporal and functional differences. The technology of making glass bottles and other glass artifacts changed rather drastically between the mid-19th century and early 20th century (v. Toulouse 1971). Identifiable innovations in the technology that can be dated include 2 and 3-piece molds, snap case molds, applied lips, laid-on-rings, lipping tools, improved pontil, embossing, and semi-automatic and automatic bottling machines (v. Toulouse 1971; Lorrain 1968; Switzer 1974). In addition bottle contents can often be identified through style and/or embossing, making it possible to date bottles even more precisely. Many manufacturers were in business for a short time, especially those making patent medicines, and are excellent time markers for 19th century archaeological sites. Unfortunately, only fragments remain at the Cold Springs and Sand Springs sites, with the exception of a single cathedral peppersauce or pickle bottle from the latter; nevertheless, several fragments could be generally dated through the manufacturer of the bottle's contents or through the technology employed.

Another method of comparing the glass artifacts from historic

sites that may be useful for dating, as well as functional analysis, is "fingerprinting" by relative color proportions. Table 4 shows glass fingerprints from Sand Springs and Cold Springs

TABLE 4  
GLASS "FINGERPRINTS" OF THE PONY EXPRESS STATIONS

SAND SPRINGS

<u>Color</u>	<u>Frequency</u>	<u>Percentage</u>
Aqua/green	330	38.7
Olive Green	14	1.6
Amber/brown	3	0.4
Clear	506	59.3
Amethyst	<u>0</u>	<u>0.0</u>
Total	853	100.0

SAND SPRINGS

<u>Color</u>	<u>Frequency</u>	<u>Percentage</u>
Aqua/green	218	70.6
Olive Green	19	6.2
Amber/brown	3	1.0
Clear	39	12.6
Amethyst	<u>30</u>	<u>9.7</u>
Total	309	100.1

Colors are not precise indicators of how bottles were used but can give very general information. Thus, aqua/green glass tends to be associated with wine/champagne bottles, olive green is typical of mid-19th century brandy and ale bottles, amber/brown is normally used for "modern" beer bottles, and clear glass is usually associated with condiment or medicine bottles. Further-

more, glass color can be useful for dating. Olive green, for example, is common in the mid-19th century and clear is common in the 20th century.

The glass "fingerprint," therefore, is caused both by functional and by time differences. Those from Sand Springs and Cold Springs suggest a mid-to late-19th century collection dominated by wine/champagne bottles. Sand Springs has a much larger proportion of clear glass than Cold Springs, caused by a later average date (a longer period of occupation), by more use of condiments or medicines, or by a combination of the two. Because the documentary record suggests that Sand Springs was occupied for a much longer time than Cold Springs, the glass fingerprints indicate a time range consistent with the pony express hypothesis.

Nails are the third kind of artifact from the archaeological record that can be used for dating historic sites in the west. The method of manufacturing nails changed rapidly during the 19th century from totally handmade or wrought, to cut, and to wire by the turn of the century (Fontana and Greenleaf 1962; Noble 1973); however, the rate of change was variable from place to place. In general the urban eastern United States had the most rapid rate of change, while the rural west had the slowest. According to Fontana and Greenleaf (1962: 44ff), the peak of cut nails in the West was reached between 1850 and 1888. Although the nails recovered from Sand Springs stations were untypeable because of corrosion, those from Cold Springs could be classified by manu-

facturing process. Table 5 shows the frequency distribution of nail types. The high proportion of cut nails suggests a mid-19th date for the site.

TABLE 5  
NAIL MANUFACTURING METHODS REPRESENTED AT COLD SPRINGS STATION

<u>Method</u>	<u>Number</u>
Wrought	
Rosehead, drawn point, common	2
Rosehead, chisel point, common	2
Flathead, fragment	1
Cut	
Fragments	54
Stamped flathead, common	46
finishing	4
T-head	2
Horseshoe	28
Hybrid	
cut common, wrought rosehead	2
Wire	0

Artifacts associated with weaponry make up the only other reasonably reliable means of dating. Weapon technology also changed rapidly during the 19th century, from flintlocks, to percussion caps, and finally to cartridges (v. Russell 1957). Table 6 shows the frequencies of different weapon technologies represented at Sand Springs and Cold Springs. Percussion cap technology is by far the most common method employed, especially if modern cartridges are excluded from the study. It was a short-lived transition from flintlocks to cartridges but was popular on the western frontier in the mid-19th century, beginning in the 1830s and lasting until the 1870s(Russell 1957, Garavalagia and

Worman 1977).

TABLE 6  
WEAPON TECHNOLOGY REPRESENTED AT COLD SPRINGS AND SAND SPRINGS  
STATIONS

<u>Method</u>	<u>Cold Springs</u>	<u>Sand Springs</u>
Percussion Caps	5	28
Minie Balls	0	5
Conical Balls	0	4
Solid Round Balls	1	11
Ramrod Handle	0	1
Gunflints	1	0
Projectile Points, Lithic Unidentified type	1	0
Humboldt Concave Base A	0	1
Eastgate Expanding Stem	0	1

Finally, a few other determinations of time were made from a variety of dateable artifacts other than those discussed above (Table 3). All of these are rare but can be used as time markers because of an embossed copyright date or other identifying information. Such artifacts include vulcanite (hard rubber) buttons and combs with Goodyear's original patent date of 1851, a pewter spoon made about 1850 by Charles Parker and Company, Meriden, Connecticut (Thorn 1949: 273), a chinese coin minted during the Ch'ien Lung dynasty, 1736-1796, a peg-type vulcanite insulator used in 1850s, and hole-in-the-top cans used throughout the 19th century but reaching a peak during the 1860s and

and 1870s (Fontana and Greenleaf 1962: 68-69). The coin is obviously an heirloom but the others fall within the time range expected if the Cold Springs and Sand Springs sites are the original pony express stations.

#### ACTIVITIES

One of the goals of the research at Sand Springs and Cold Springs is to identify the human activities that took place at pony express stations. Some activities are unique and are diagnostic of pony express stations; yet others are the same as those of a ranch house. In some cases, of course, the pony express used existing forts (such as Fort Churchill), town businesses, or ranches as stops with no significant changes in activities.

The stations in remote areas, such as Cold Springs and Sand Springs, had to satisfy a few basic demands and these determined the activities that took place. First and foremost, the attendants had to satisfy their own domestic needs, including food provisioning, preparation, and consumption; security; sleeping; clothing and other personal needs; and refuse disposal. Burton noted in a number of instances that domestic activities generally occurred in a single room, with at most a sleeping/storage area partitioned off with canvas, as at Butte station in eastern Nevada (1862: 469). Refuse at this station was dumped just outside the door:

Outside the door...(was) a slab acting stepping-stone over

a mass of soppy black soil strewed with ashes, gobs of meat offal, and other delicacies. (ibid.)

Secondly, animal accommodations, including both subsistence and security, had to be provided, along with the necessary tack and activities, such as shoeing, for their maintenance. Burton observed haystacks at a number of stations, including Cold Springs and Sand Springs, and corrals at a few, including Butte station. Thirdly, various kinds of activities required for maintenance and repair were part of the pony express repertoire. Thus, Burton notes that at Butte station "...tools were not wanting - hammers, large borers, axe, saw and chisel" (ibid. p. 470). In addition blacksmithing used for shoeing horses and related tasks could be expected.

None of these activities is unique to a pony express station; nevertheless, their archaeological record should include evidence of all of these. Table 7 lists the kinds of activities that should be present at a pony express station and the archaeological evidence of these activities, including artifacts, architecture, and soil features. The presence or absence of this evidence at Cold Springs and Sand Springs is noted alongside. There can be no question that all of the activities expected at a pony express station are present at both sites, adding support to our identification.

TABLE 7

## ARCHAEOLOGICAL EVIDENCE OF HUMAN ACTIVITIES

<u>Activity</u>	<u>Archaeological Evidence</u>	<u>Cold Springs</u>	<u>Sand Springs</u>
Domestic	Food provisioning		
	weapons	X	X
	storage facilities	X	X
	Food preparation and consumption		
	ceramic, glass containers	X	X
	utensils	X	X
	faunal/floral remains	X	X
	fireplace	X	X
	Security		
	weapons	X	X
	architectural fortification	X	X
	Refuse disposal	X	X
	Furnishings		
	wall plaster/chinking	X	X
	door hardware	X	
	window glass		X
Record-Keeping	Personal		
	clothing	X	X
Animal Husbandry	grooming	X	X
	adornment	X	X
	tobacco pipes		X
Maintenance/Repair	Pen points	X	
	Ink bottles	X	
Maintenance/Repair	Tack	X	X
	shoes/shoeing nails	X	X
	Manure deposits	X	X
Maintenance/Repair	Blacksmithing - slag	X	X
	tools	X	X

## ARCHITECTURE

The architectural design and construction of Sand Springs and Cold Springs stations are quite similar (Plates 1,3). Both are rectangular and about the same size, with walls made of 2 courses of undressed rhyolitic boulders that have been collected locally and set dry. Chinking is found on the interior walls of the rooms that are used for household activities; there is no other evidence of finishing. The walls are about 2.5 feet thick, 4 to 7 feet high, and penetrated by doors, windows, and gunports. Gunports are found only in the exterior walls, suggesting the turbulent times of the pony express. Little information about the roof is available. When Sir Richard Burton visited both stations in October of 1860, neither had a roof; however, the archaeological record indirectly supports the existence of a roof at Sand Springs, and it is probable that both had a "willow thatch" roof at one time. Because lumber was scarce, the timbers supporting the roof were usually removed after a building was abandoned. It is not surprising, therefore, that there is little archaeological evidence of a roof. The interior of both stations is divided into several rooms, but the floor plans are not identical; nevertheless, the activities taking place in the rooms are similar. And both Sand Springs and Cold Springs stations are larger than other pony express stations in Nevada and Utah.

### SAND SPRINGS STATION

The floor plan of Sand Springs station is rectangular, more

or less, with the long axis oriented east-west (but with a 10 degree inclination south of west) (Figure 1.). There are six rooms: three small ones on the western end (Rooms 1, 3, and 6) have archaeological evidence of domestic activities and are heavily chinked, and Rooms 2, 4, and 5 on the eastern end were apparently used for stables, corrals, and refuse disposal. Wall elevations are given in Figures 2 through 5; all of the walls are constructed with dry set rhyolitic boulders, apparently collected from the vicinity where they have been transported by flash floods from the nearby Stillwater Range. The variation in boulder size appears, intuitively, to be much greater at Sand Springs than at Cold Springs and probably reflects the relative scarcity of boulders at the former site.

#### Room 1

The small room in the southwestern corner of the building is designated as Room 1. It has a square floor plan with inside dimensions of 13.7 feet north-south and 13.1 feet east-west. Two doorways were located: one doorway, 2.8 feet wide, opens through the north wall into Room 6, the other, 3.3 feet wide, has been punched through the east wall and opens into Room 2. The interior walls are daubed with an alkali mud, much of which has fallen onto the floor of the room.

In the southwest corner of the room is a fireplace, 3.33 feet wide and 4.25 feet high, with a smokehole 19 inches in diameter at the top of the firebox that narrows to 13 inches at the

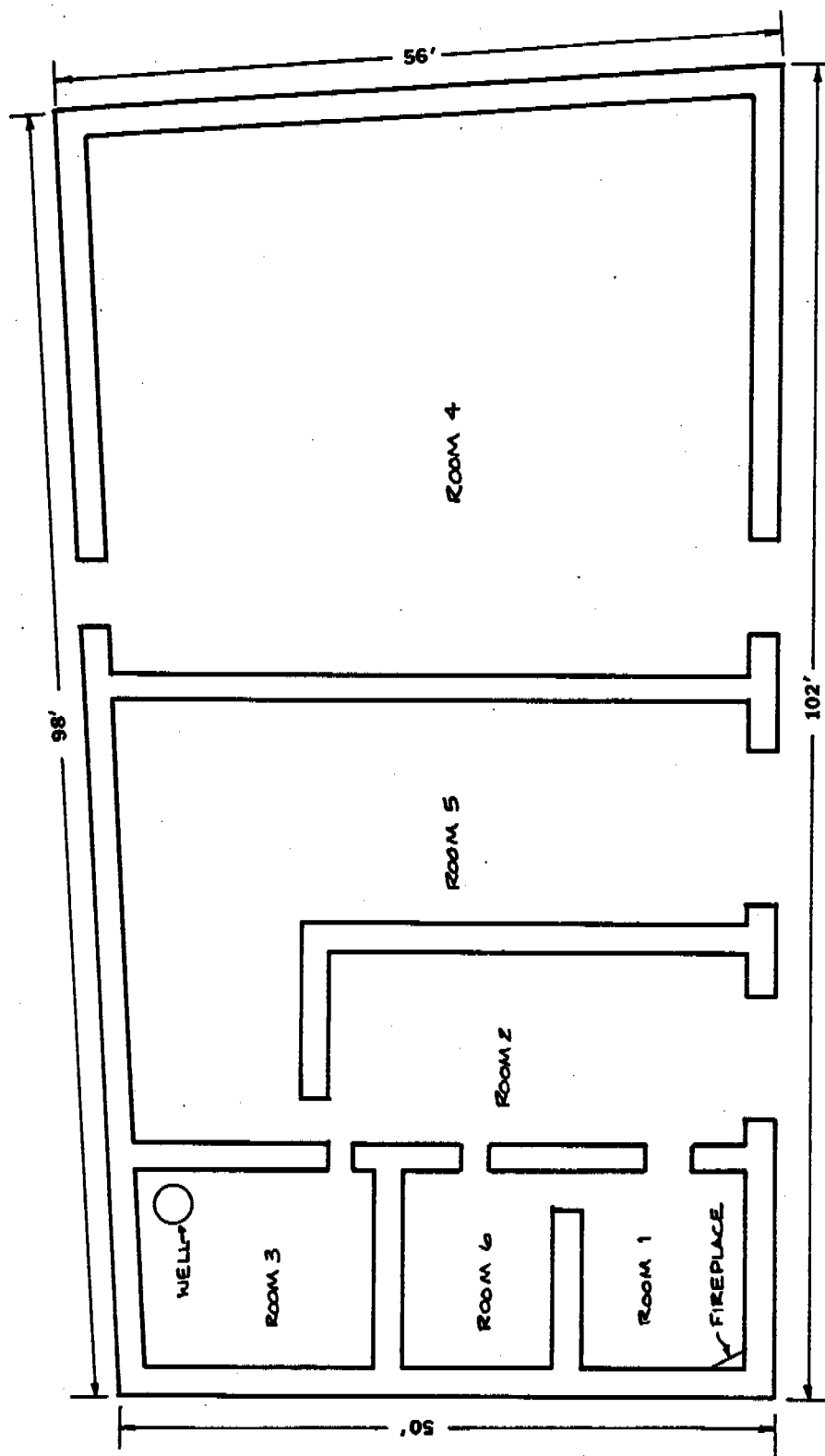


Figure 1. Floor Plan of the Sand Springs Station

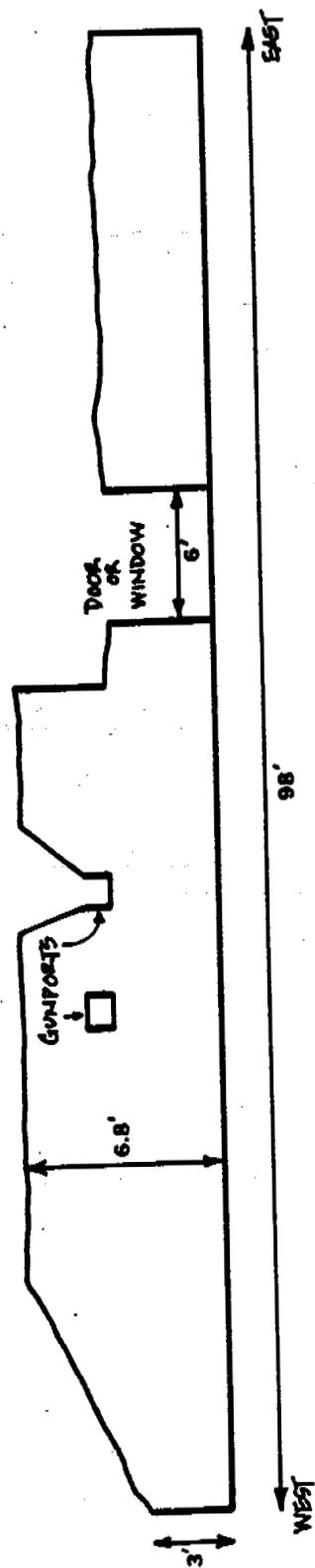


Figure 2. Elevation of North Outside Wall at Sand Springs Station

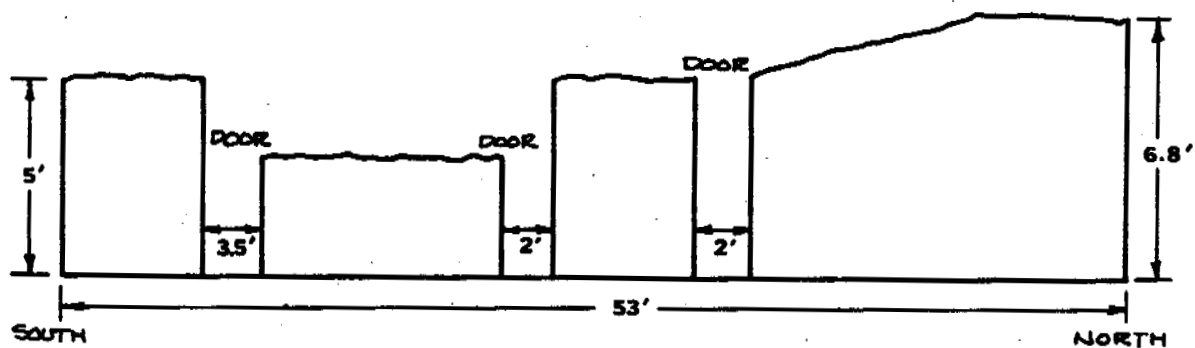


Figure 3. Elevation of Interior Wall Separating the Residential Rooms (Rooms 1, 3, and 6) from the Foyer and Stable (Rooms 2 and 5) in Sand Springs Station

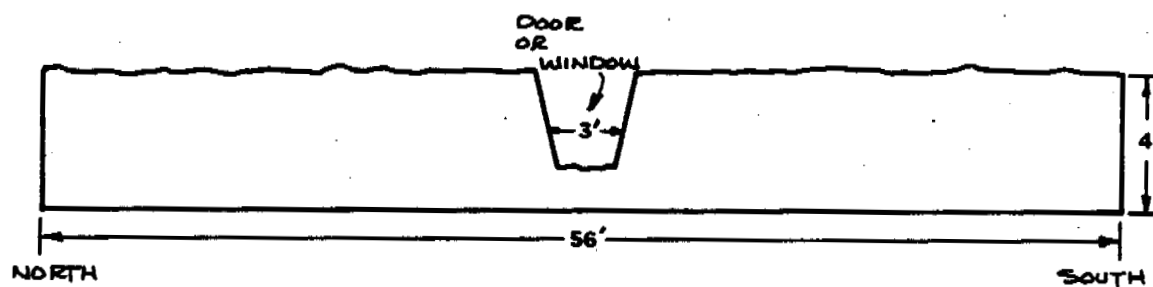


Figure 4. Elevation of East Outside Wall at Sand Springs Station

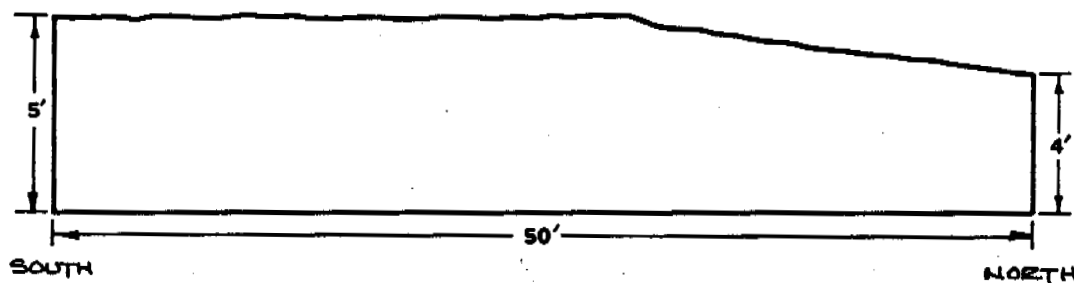


Figure 5. Elevation of West Outside Wall at Sand Springs Station

top of the daub-covered chimney. The firebox is at floor level and is 19 inches wide, 20 inches high, and 14 inches deep. Several metal rods are fitted into the top of the firebox, suggesting some kind of support for cooking pots. A rather extensive ash/charcoal layer radiates out from the soot-covered firebox into the room, bounded by two small rhyolite boulders toward the west wall and a metal rod toward the south. Such an arrangement may have been an extension of the firebox itself; if so, it is easy to understand why Sir Richard Burton complained about a "smoky fire in one corner" (1862:491).

Room 1 has no windows and no direct evidence for a roof; however, there is a relatively thick layer of ash and charcoal over most of the floor. Either a room collapsed and burned, or the fireplace is responsible. No timber fragments were recovered that might conclusively answer the question, but their absence is to be expected; it was common practice in the American West to scavenge large pieces of wood wherever they could be found. Interestingly enough, two floor joists, 3 feet apart and extending into Room 6, were located under the north wall. The joists are pine, 6 inches wide and 1.5 inches thick, and have disintegrated at both ends, leaving about a 3 foot long section under the wall; the bottom of both the joists and the wall extend into the sterile sand underlying the cultural deposit. The north wall, separating Room 1 from Room 6, is not integrated into the perpendicular west wall but butts up against it. That fact strongly suggests the wall was added on to divide a large

room into two smaller ones; if so, the original room was rectangular with inside dimensions 24.7 feet north-south and about 13.3 feet east west.

Room 2 The rectangular room situated next to the east side of Room 1 is designated Room 2; it has inside dimensions of 17.2 feet along the east-west axis and 30.5 feet along the north-south axis. Five doorways provide exits. One doorway, 3.3 feet wide, opens through the west wall into Room 1. Another doorway, 2.0 feet wide, opens through the west wall into Room 6. Just north of this doorway is a third one, 213 feet wide, also opening through the west wall into Room 3. In the northwest corner of the room is yet a fourth doorway, 4.2 feet wide, this time opening through the north wall into Room 5. The fourth doorway, 9.8 feet wide, opens through the south wall, near the southwest corner, to the outside. Walls have collapsed around all of the doorways, making exact measurements impossible.

Room 3 Room 3 is a rectangular room in the northwestern corner of the station and has inside dimensions of 17.0 feet east-west and 20.7 feet north-south. A single doorway provides an exit through the east wall, at the southeast corner, into Room 2; the doorway is 2.3 feet wide. As in all the rooms except for Room 5, no windows or gunports could be identified. The walls have two courses of rhyolite boulders, apparently selected for size, but not modified. Unlike Rooms 1 and 6, the interior surface of the walls is not heavily daubed; however, a relatively

thin layer of clayish material on top of the living zone suggests that some daubing was used but had fallen. A 10-inch thick layer of refuse covers the floor of the room, making a "living zone" rather than a living floor. A stonelined well in the northeast corner is 2.8 feet in diameter and 7+ feet deep; it is lined with a single course of small rhyolite boulders and an arrangement of wire and iron hooks is associated, suggesting a windlass or other device used for raising water from the well.

Room 4

The largest room in the building covers the eastern one-half and is square with inside dimensions of 42.0 feet along the east-west axis and 50.5 feet along the north-south axis. There is little evidence for daubing of interior walls nor a roof; however, a wooden shingle with dimensions 45 cm wide, 60 cm long, and unknown thickness was located near the northwest corner, just below a fibrous, organic deposit and apparently lying on top of the original sand dune surface (identified as stratum 3) upon which the station was built. No doorways are clearly marked but a collapsed section of the north wall at the northwest corner probably is an opening to the outside. A relatively heavy concentration of bone and a few artifacts occur just above or on the organic living zone. Most of the bone is from cow, including a skull and articulated limbs, designated as Feature 2, in the northwest corner; it appears to be part of a temporary

occupation after the station had been abandoned and may be correlated with a wagon under-carriage found in Room 5.

Room 5 The largest interior room at Sand Springs is the L-shaped structure designated Room 5. Its east-west arm is adjacent and parallel to the north wall of the building and is 31.5 feet long; the north-south arm is adjacent to and west of the east wall of Room 2 and is 50.8 feet long. In the northwest corner of Room 2 is a doorway that connects through the south wall, and the only "windows" (2) at Sand Springs are in the north wall of Room 5: they are identical in structure and size to the gunports at Cold Springs pony express station. As in Room 4, there is no evidence of either wall daubing or a roof. The living zone is similar to that of Room 4, that is, a fibrous, organic deposit suggesting manure, but is considerably thicker and contains a higher concentration of refuse and artifacts. A wagon undercarriage was located about six inches above the living zone, suggesting a short occupation after the station had been abandoned and supporting a 1908 prospector's occupation.

Room 6 Perhaps the most unusual room at Sand Springs is situated between Rooms 1 and 3 on the west end of the building and is designated Room 6. It is the smallest room at the station, having a rectangular shape with inside dimensions of 9.6 feet north-south and 13.7 feet east-west; there are no windows, but a single doorway, opening into Room 1 through the south wall at the southwest corner. The interior walls are heavily daubed and

a thick deposit of the daubing material has fallen upon the living zone; however, the living zone is not clearly defined, containing very few artifacts or refuse, and undistinctive sediments.

#### Architectural History

The archaeological record of Sand Springs station suggests that the present building is the end product of several stages of construction. In the beginning, the station was square and enclosed the space taken up by Rooms 1, 2, 3, 5, and 6. Although it is clear that the building was divided into rooms at this time, exactly how many is uncertain; the wall separating Rooms 3 and 6 and the one separating 3 and 6 are interdigitated with the outside wall, so that the minimum number of original rooms is 3: Room 3, Room 5, and a large room made up of Rooms 1, 2, and 6. The wall separating Rooms 1 and 6 and the one separating Rooms 1 and 6 from Room 2 abut the outside walls and were probably built later; there is nothing in the archaeological or documentary records to suggest when.

The second building stage at Sand Springs station was the addition of a stone corral to the east end of the building, an interpretation based upon the observation that the corral walls (Room 5) are not integrated into the rest of the station. Structurally, the corral at Sand Springs is identical to the corral at Cold Springs and may have been added after the pony express occupation; at least it was built after the main part of the station

had been completed.

One other important building event took place at Sand Springs, but it is impossible to tie it in to any of the other building stages, other than that it was not part of the original building. The event is the building of a wooden floor in the original room and the construction of a wall on top of the floor that separates the room into Rooms 1 and 6. The interpretation is supported by:

1. Two floor joists under the wall between Rooms 1 and 6.
2. The wall separating Rooms 1 and 6 is not integrated into the western exterior wall of the original building but abuts against it.
3. Burton's statement that Sand Springs station had an "impure floor" (1862:491), suggesting that the wooden floor was not part of the original building.

It is unlikely that rooms with a wooden floor would not have a roof; however, there is little direct archaeological evidence for a roof.

#### COLD SPRINGS STATION

The floor plan of Cold Springs station is rectangular with indentations at both the north and south ends (Figure 6), and, unlike Sand Springs station, the orientation of the long axis is approximately north-south. There are 4 rooms, arranged in a line along the north-south axis. At the southern end, Room 1 contains a fireplace and other archaeological evidence of domestic activities. Room 2, directly north, was an open area used for

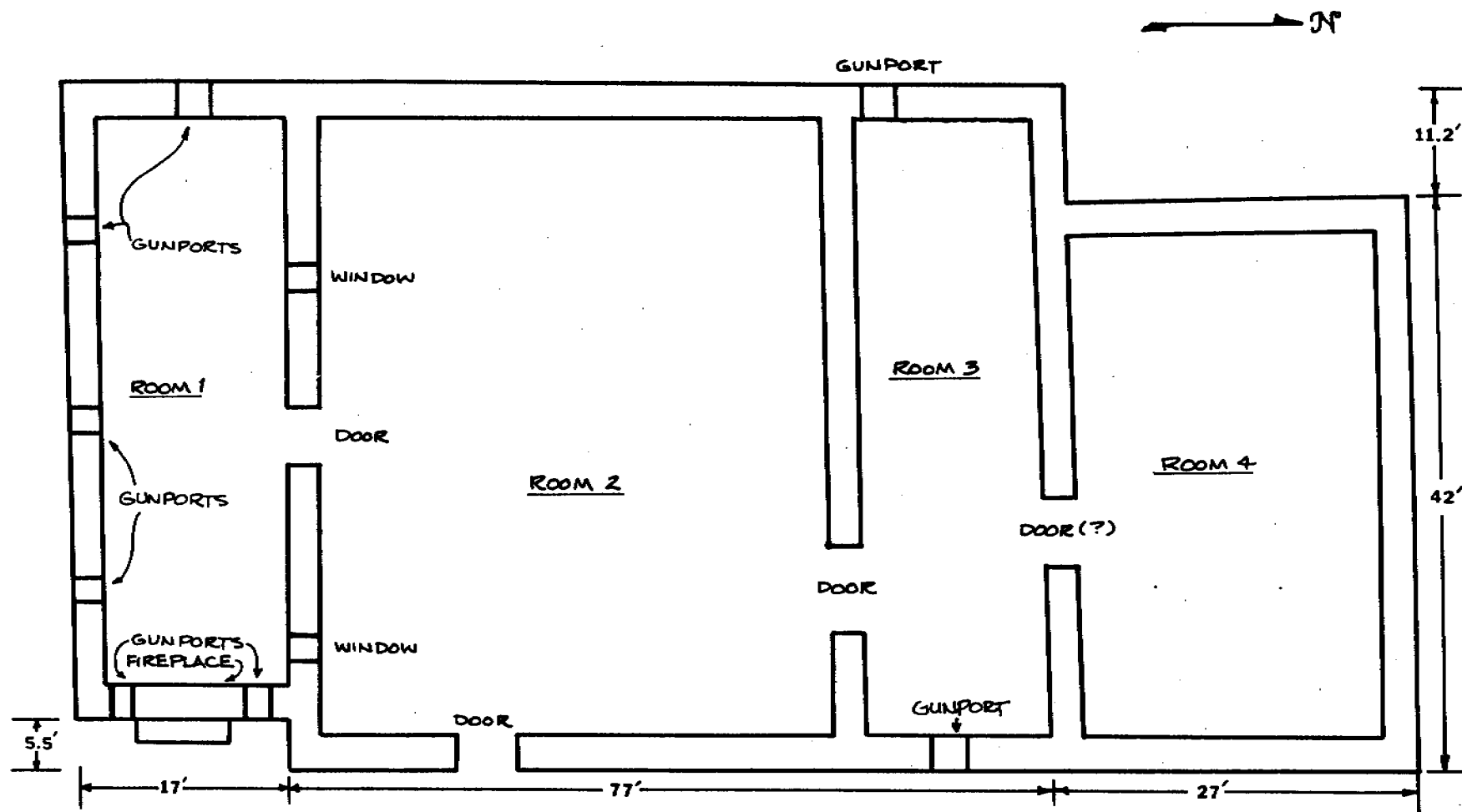


Figure 6. Floor Plan of Cold Springs Station

blacksmithing, horseshoeing, refuse disposal, and other activities, and the remaining rooms at the north end of the building were used as a stable and corral, respectively. Wall elevations are given in Figures 7 through 10. The walls are constructed from dry-set rhyolitic boulders of a quite regular size, about 2 feet long, 1 foot wide, and 1 foot thick; only the interior walls of Room 1 are plastered, especially well preserved around the fireplace where it has been baked.

Room 1 The southernmost room in the building is designated as Room 1. It has a rectangular floor plan measuring 44.5 feet along an east-west axis and 14.0 feet along the north-south axis; the room is enclosed with dryset rhyolite boulder walls averaging about 6 feet high where they have not collapsed. Five "gunports," each measuring 1.3 by .6 feet on the inside, are in the east, south, and west walls, and two windows, each about 3.3 feet square, are in the north wall shared with Room 2. A doorway, about 9.8 feet wide and of indeterminate height, occurs in the north wall. And a fireplace is recessed in the east wall (Plate 4).

Room 2 The room directly north of Room 1 is designated as Room 2 and has a rectangular floor plan measuring 48.8 feet (east-west axis) by 42.2 feet (north-south axis). As in Room 1, the room is enclosed with dry-set rhyolite boulder walls averaging 6.4 feet high; however, the west wall is badly collapsed and is sometimes only 2 feet high. Two windows are situated in the south wall, also the north wall of Room 1 and described there.

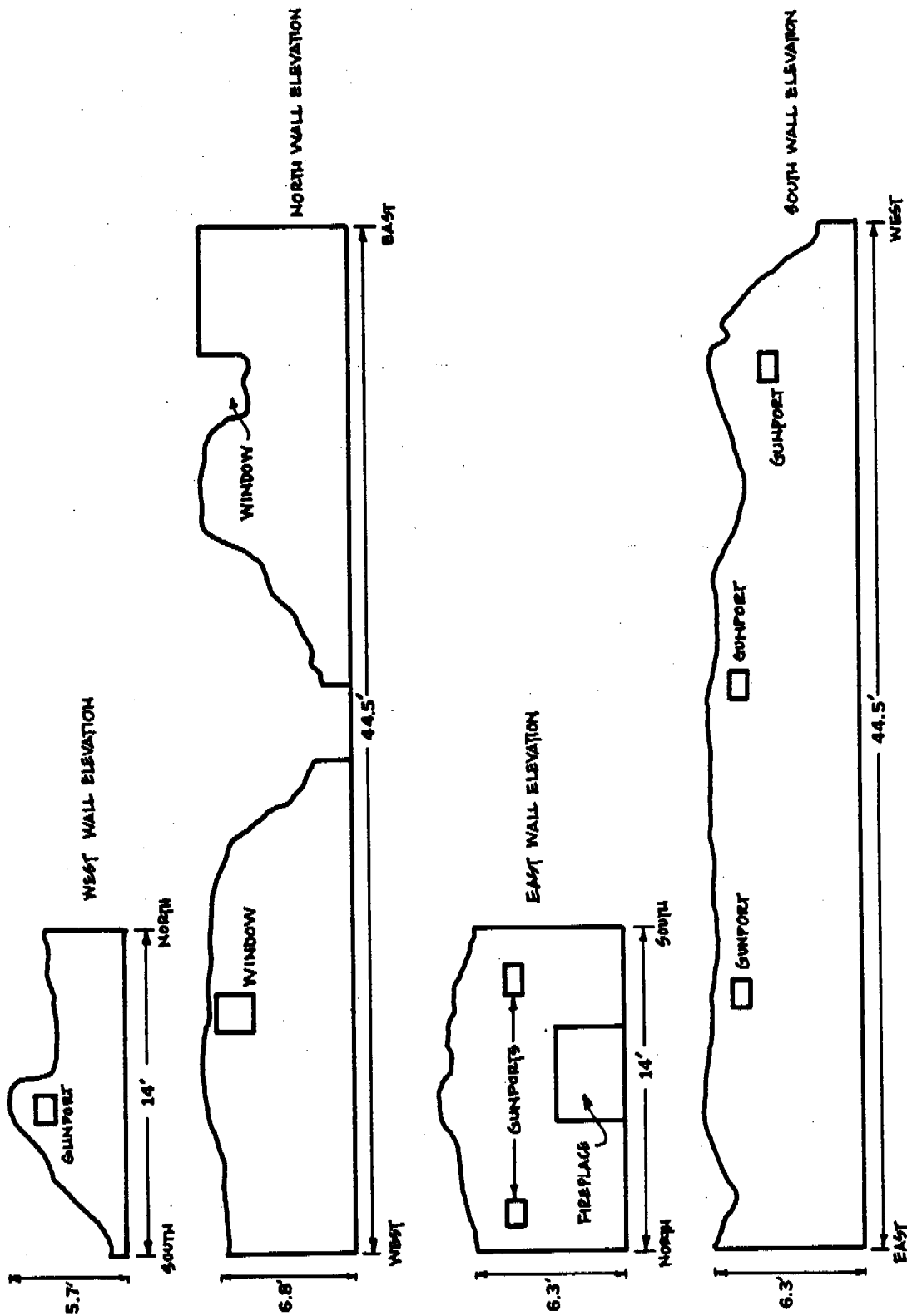


Figure 7. Elevations of Room 1 at Cold Springs Station

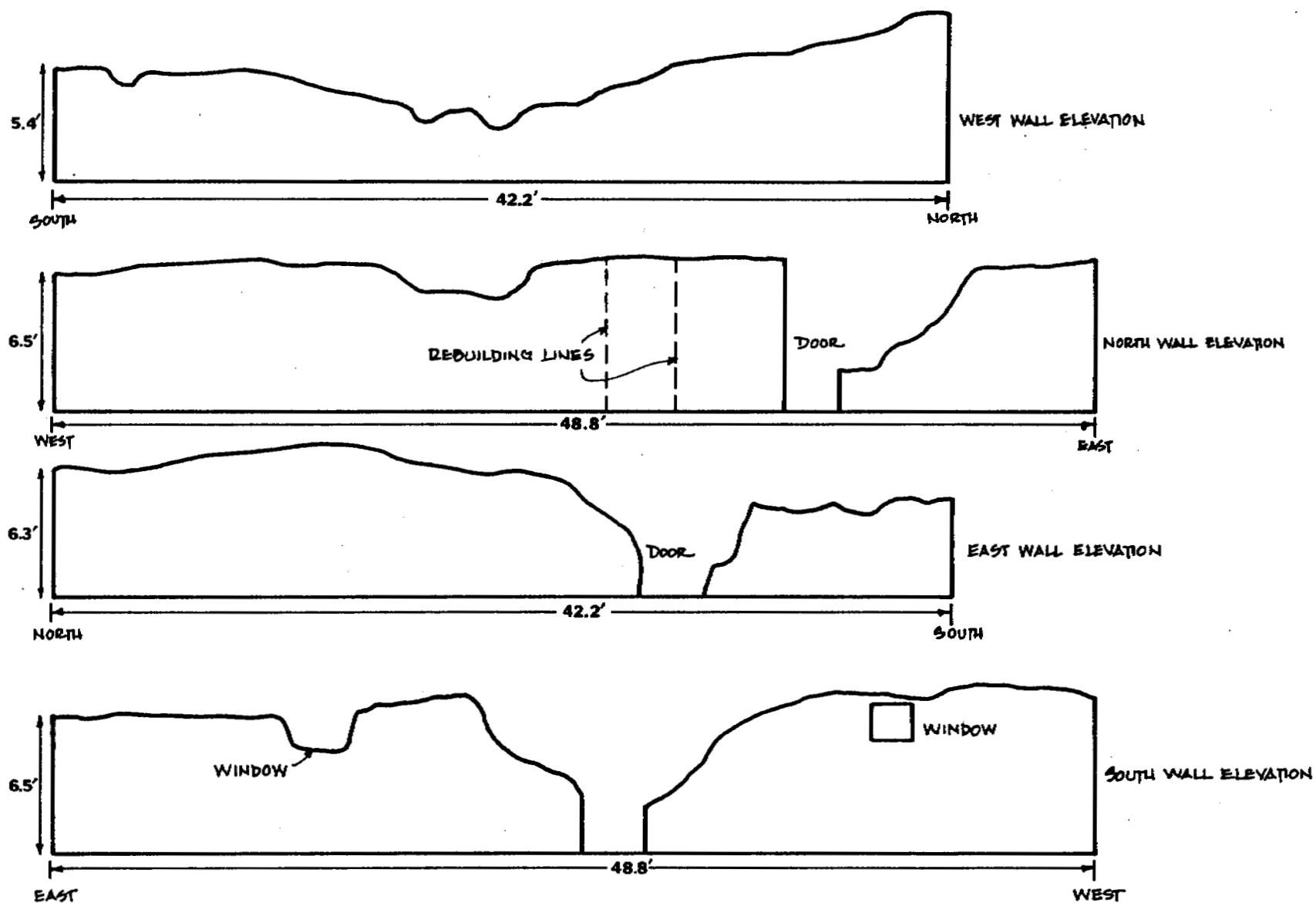


Figure 8. Elevations of Room 2 at Cold Springs Station

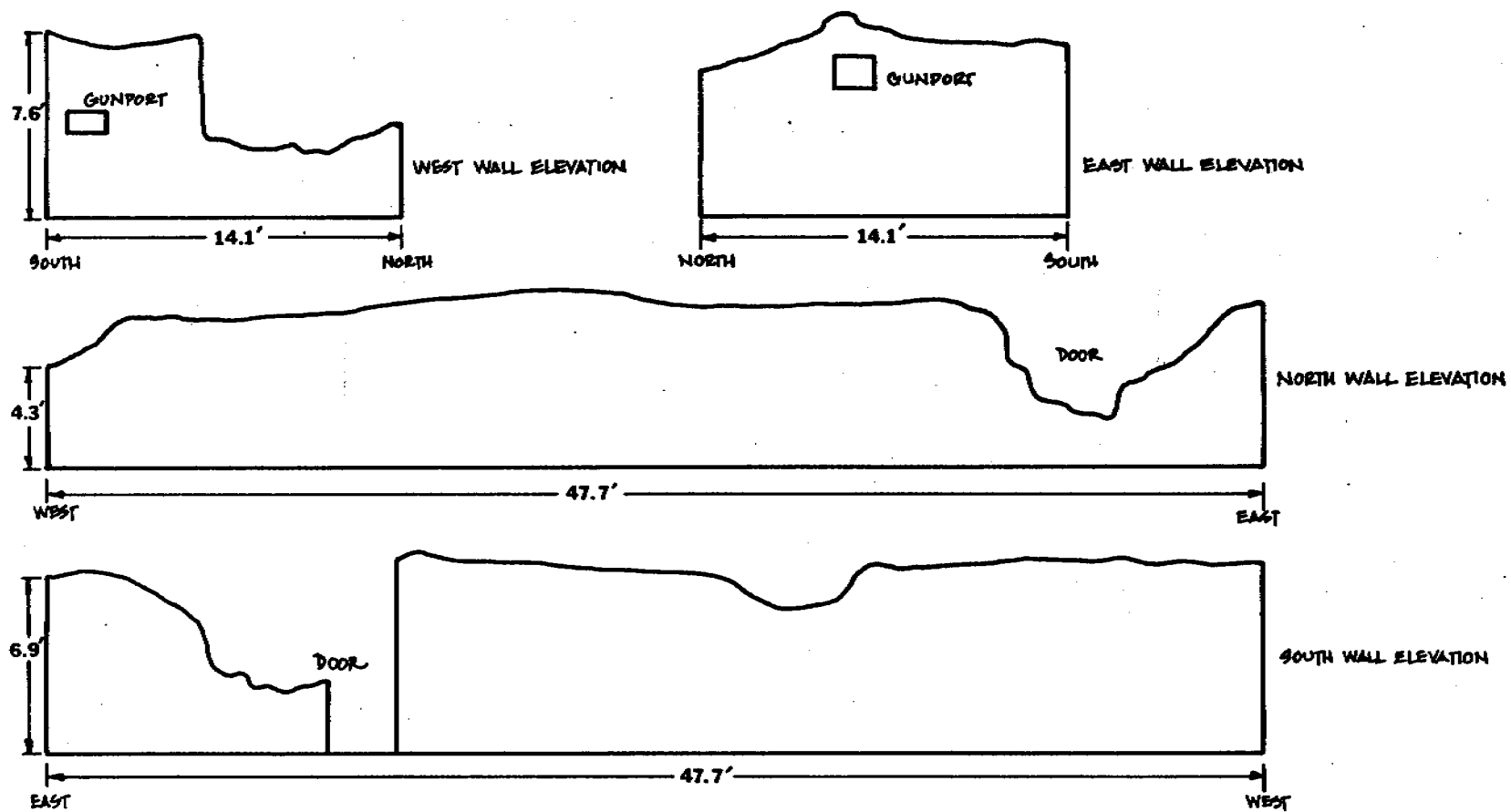


Figure 9. Elevations of Room 3 at Cold Springs Station

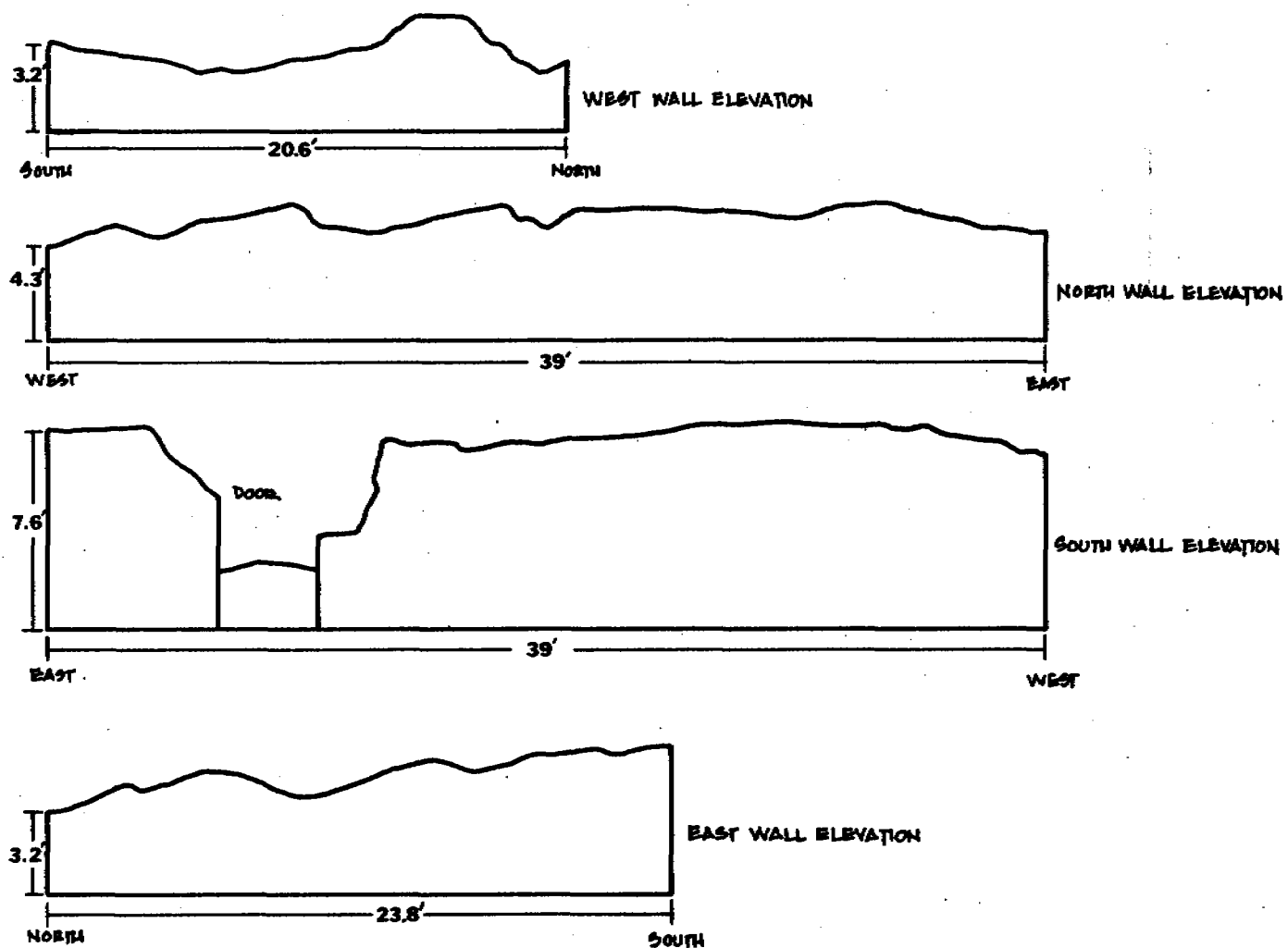


Figure 10. Elevations of Room 4 at Cold Springs Station



PLATE 4. FIREPLACE IN ROOM 1 AT COLD SPRINGS STATION

A doorway is in the north wall, beginning about 9.8 feet west of the east wall; it is 8.1 feet wide and has an indeterminate height.

Room 3 The room directly north of Room 2 is designated as Room 3, with a rectangular floor plan measuring 47.7 feet (east-west axis) by 14.1 feet (north-south axis) and walls constructed from rhyolite boulders collected locally and dry-set. Both the north and east walls are in good condition, standing about 7 feet high; however, the west wall, ranging in height from 2 feet to 7 feet, is partially collapsed. The entire north side of the wall has fallen, but in such a way that the outline of an earlier doorway is clearly indicated. In addition to the doorway in the west wall, a doorway connects Rooms 2 and 3 through the south wall and Rooms 3 and 4 through the north wall. The south doorway has been rebuilt twice; the north doorway is not a prepared opening at all: it is a "hole" punched through the wall, probably after the pony express station had been abandoned. Two windows, one in the east wall and one in the west wall, are present. Both are about the same size, inside dimensions of .8 foot high and 1.1 feet wide, and appear to be gunports that have been punched through the walls rather than built into them as in Room 1. Finally, a small rectangular niche, 2.3 feet long, 1.0 feet high, and 1.0 feet deep into the wall, is situated directly below the east wall window at ground level. There are no clues to its identification.

#### Room 4

Room 4 is the northernmost in the station and has a rectangular floor plan, measuring 39 feet (east-west axis by 20.6 to 23.8 feet (north-south axis). As in the other rooms, the walls are constructed from rhyolite boulders collected in the vicinity and dry-set; however, the boulders are smaller, the construction cruder, and the walls not as high as elsewhere, ranging from 3.2 to 4.3 feet in height, although there is no evidence of a collapse. No windows or gunports are present, and the only doorway is the crude opening punched out of the wall shared by Rooms 3 and 4 and previously mentioned. The west wall of the room is not contiguous with that of the adjacent room, Room 3, but jogs about 11 feet east; in addition, neither the east nor the west wall is interdigitated with the wall of the adjacent room, suggesting that Room 4 was added at a later time.

#### Architectural History of Cold Springs Station

Architectural and archaeological data suggest that the present building at Cold Springs station is the end product of several stages of construction. The model with the best support has 2 building stages:

1. The two middle rooms (2 and 3) were built.
2. The south room (1) was then added as a defensive measure, probably after the Paiute uprising; a series of other architectural modifications to the original structure was also made during this stage.

1. The outer walls of Rooms 2 and 3 form a continuous unit, with the corners being interdigitated rather than made up of separate walls butting against each other; a large boulder forms the southeast corner of the unit and is part of original building. Two large windows are situated in the south wall, now adjacent to Room 1, which was not part of the earliest structure. Windows are also found in the east and west walls (one each) of Room 3; however, both of these windows are smaller and much lower than those in the south wall, and both appear to have been "punched" through at a later time. The small window in the west wall of Room 3 is quite close to the original outside doorway. Although this doorway is blocked up in the present structure, its outline is still clear in that part of the wall that has not collapsed; the closing of the doorway may have been a later "defensive" modifications and the windows may have been punched through at this time to serve as gunports. The original doorway is further marked by horse or cow dung deposits both inside and directly outside the postulated doorway, suggesting that Room 3 was at that time used as a stable and that it was cleaned by throwing the accumulated dung out the door. After the original doorway was blocked up, a new doorway was punched through the east wall of Room 2, near the southeast corner; this doorway was the only entrance to the Cold Springs station after Stage 1.

Rooms 2 and 3 are today separated by a wall with a narrow

doorway near its east end. The wall butts up against the outside walls rather than being integrated into them and suggests that it was added after the original building was constructed; furthermore, the wall was added to twice after its initial construction (Plate 5), each time narrowing the doorway between Rooms 2 and 3 by about five feet. The additions may be correlated with changes in the activities taking place in Room 3.

There is no evidence that Room 2 had a roof at any time; however, Room 3 may have had. The east wall of the room was peaked, suggesting that a roof was at least intended, and a single posthole was found in the middle of the floor, suggesting a roof support; nevertheless, there is no evidence of a collapsed roof in the deposits of the room.

Because of the small time difference, it is not surprising that, in general, the artifacts recovered from Room 2 give no indication of being earlier than the other rooms; furthermore, Room 2 was still used after the station was rebuilt. It is intriguing to find, nevertheless, that the only wrought nails recovered from the station came from this room.

2. During the late spring and early summer of 1860, a Paiute uprising greatly changed the social environment of Cold Springs. The station was attacked several times, successfully at least once: On May 11 of 1869, the stationmaster was killed and the building burned, an event documented by Robert "Pony Bob" Halsam



PLATE 5. REBUILDING OF WALL SEPARATING ROOMS 2 AND 3 AT COLD  
SPRINGS STATION

on his famous ride. Other instances of stock being run off are also well known. The original station was not built for defensive purposes, as evidenced by the many large open windows; however, the changed social environment forced architectural modifications consistent with social reality. Thus, on July 2, 1860 the Sacramento Union noted that the Pony Express stations most affected by the Paiute war were being rebuilt and "fortified."

The major change at Cold Springs station was the addition of a "fortified" room, Room 1, to the south end of the original structure. Room 1 is offset, with its east wall starting about five feet west, and beyond the large corner boulder, of the east wall of the original building. The west wall is aligned with that of the original structure, but both the east and west walls of Room 1 clearly butt against the south wall of Room 2, supporting the interpretation that Room 1 was a later addition. And instead of windows, Room 1 has several well-constructed gunports, small openings in the walls that constrict toward the outside (Plate 4). One gunport is present in the west wall, two in the east wall, and three in the south wall; the north wall, shared with Room 2, has no gunports but two large windows, consistent with the interpretation that Room 1 was a later addition. Otherwise, it would be difficult to explain why there are large windows in a wall separating two rooms.

Room 1 is floored with a clayish material that seems to have been prepared rather than being simply the result of use. And

this is the only room in the structure with evidence of an intentionally prepared floor. The floor is nearly level and is built upon an earth fill containing a high density of artifacts and refuse: outside the south wall of the original building, the ground surface slopes rather sharply toward the creek and the earth fill makes an artificial level surface. The artifacts and refuse included in the fill indicated human activity at Cold Springs prior to the construction of Room 1 and provides yet additional support for the rebuilding hypothesis. Especially significant are percussion caps, spent bullets, and a projectile point, suggesting the military activities of the Paiute war.

There is better archaeological evidence for a roof in Room 1 than in any other room. First of all, a charcoal-ash layer overlies the floor along the south wall and may be the remains of a "willow thatch" roof that had burned and collapsed in toward the walls. Such an interpretation is supported by the occurrence in the room of a grayish brown gravelly loamy sand often used as a "topping" for a willow thatch roof. Although no large branches or supporting timbers were recovered, scavenging of wood from old buildings is a common practice in this part of the country; furthermore, Mr. Walt Mulcahy (personal communication) located a large fragment from this room several years ago. Additional evidence is provided by a photograph taken several years ago by the same person showing a definite peak in the east wall of Room 1. The peak has since been destroyed by the partial

collapse of the wall. A final bit of support for the roof hypothesis is the occurrence of a fireplace and chimney built into the east wall of the room; it seems unlikely that a chimney would have been constructed in an open building.

Other architectural modifications are less certain. The blocking up of the doorway to Room 3 and subsequent punching out of "gunports" and an outside doorway in Room 2 have already been proposed as defensive changes taking place during this stage; additions to the partition separating Rooms 2 and 3 may also belong here, as part of the change converting Room 3 from a doorway area to a room for specialized activities. The roof to Room 3 would also have been added then. Room 4 was added to the building after the original structure was constructed, an hypothesis supported by the absence of interdigitated walls between Room 4 and Room 3, and may have been added during stage 2; further information about the relative position of Room 4 in the building sequence at Cold Springs station is unknown.

The actual time period during which rebuilding took place is uncertain. Sir Richard Burton visited Cold Springs station on October 15, 1860, and he described it as a "wretched place, half built and wholly unroofed" (1862:487). His description would fit either the original building or rebuilding in progress but not completed. Because the Paiute uprising had subsided by June or July of 1860, it is likely that rebuilding would have begun then or shortly thereafter, supporting the latter alternative; it was probably completed during the late fall or winter of 1860.

## FORMATION OF THE ARCHAEOLOGICAL RECORD

Schiffer (1976) points out that the processes responsible for the formation of the archaeological record are twofold: cultural and natural. The material by-products of human activities are deposited by means of several cultural processes, each of which has different impacts upon artifact patterns. Discard is a process familiar to all of us: artifacts are "dumped" someplace other than where the activity occurred, close or far away depending upon specific cultural rules and characteristics of the material. Sir Richard Burton's description of a refuse disposal zone just outside the front door at Butte station in eastern Nevada suggests where artifacts and food refuse were likely to be dumped by pony express attendants (1862: 469). Loss is another cultural process that may determine how artifacts enter the archaeological record: small, sometimes valuable items that would not otherwise be disposed of, are accidentally lost at the very place where an activity is taking place; they may disappear through a crack in a wooden floor or be trampled into a loose dirt floor, reappearing in archaeological collections years later as direct clues to past human activities. Finally, artifacts enter the archaeological record through abandonment: when a pony express or stage station is no longer being used, for example, it slowly begins to disintegrate. Such architectural features as mud plaster melts into the floor, along with other parts of the building that have not been removed. "Abandoned" refuse, such

as this and such as bricks, nails, and window glass elsewhere, are likely to be an important part of the archaeological record of buildings. What happens after artifacts have been discarded, lost, or abandoned is largely a function of their chemical and physical characteristics, how fast they are "buried," and the depositional processes responsible for their burial. Gifford (1978), for example, has observed that if an archaeological site is buried rapidly by silt carried by slow-moving water, as around lake margins, artifact patterns are not greatly disturbed. On the other hand, if "flash" flooding is responsible for their deposition, small artifacts may be carried for long distances away from their original position. Furthermore, if organic materials are left in the open for long periods of time before being buried, scavengers can greatly disturb their original pattern. These are all examples of natural processes that have an impact upon the formation of the archaeological record.

Both cultural and natural processes have played a role in the formation of the archaeological records of Cold Springs and Sand Springs station. They are discussed below within the framework of the stratigraphic sequence that could be recognized at each of the two sites.

#### SAND SPRINGS STATION

The archaeological site of Sand Springs station is situated at an altitude of 3925 feet in a semi-stabilized sand dune area on the eastern shoreline of extinct pleistocene Lake Lahontan;

immediately north of the site are active dunes, including spectacular Sand Mountain, and south and east of the site is an alkali flat, the floor of the ancient lake. Further north, east, and west of the sand dunes is the Stillwater Range. Erosion and flashflooding from this range have deposited rhyolitic boulders through the sand dune area, along with various other kinds of cryptocrystalline and crystalline rock fragments. A salt desert shrub plant community covers the semi-stabilized dunes; it is dominated by the following species: Big Greasewood (Sarcobatus vermiculatus), Shadscale (Atriplex confertifolia), Indian Rice Grass (Oryzopsis hymenoides), Horsebrush (Tetrademia glandulosa and Tetrademia spinescens), and Fourwing Saltbrush (Atriplex canescens). The plant cover over the site is about 30 percent, but decreases to 15 percent or less in the active dune area to the north and increases to 60 percent or more on the periphery of the alkali flat to the south and east. Salt grass (Distichlis stricta) becomes the dominant plant species around the alkali flat, where the water table is only two feet below the surface.

Sand Springs station is built upon a low sand dune. Human activities have deposited a 1 to 25 centimeter thick stratum of artifacts, bone, charcoal, ash, and manure, best described as a "living zone" within which objects were continually being churned and kicked around; because of the absence of a prepared floor and because of the sand/charcoal/ash matrix, a distinct living "surface" could not be identified. After the station was abandoned,

daub plaster from the walls of the living quarters collapsed onto the floor. The daub stratum either lies directly upon the floor or is separated from it by an intervening, discontinuous sterile sand deposit identical in texture and color to the dune. Finally, several feet of aeolian sand covers the station as a whole.

Room 1 (Figure 11)

Stratum 1 is a 1.5 meter thick deposit of pale yellow (Munsell notation 2.5Y7/4 dry) aeolian sand. The deposit is clearly bedded but there is little variation in the size and color of the sand grains; an exception is a thin band of coarse, gray sand that occurs in places throughout the dune and may represent an old dune surface during a relatively stable period. Typically the stratum lies less than 25 centimeters above the living zone and is sometimes situated directly beneath boulders that have fallen from the walls of the station.

Stratum 2 is an undulating deposit of mixed clay/loam sediments with carbonate inclusions. Its color varies from light yellowish brown (Munsell notation 2.5Y6/4 dry) to light gray (Munsell notation 2.5Y7/2 dry). The thickness of the deposit (9-20cm.) tends to increase toward the walls of the room, and clay/loam clumps are often associated with fallen boulders from the walls. Very few artifacts were recovered from the stratum. It can be best interpreted as a daub plaster originally covering the inside of the walls but later collapsing onto the floor.

Stratum 3 is an olive brown (Munsell notation 2.5Y4/4 dry)

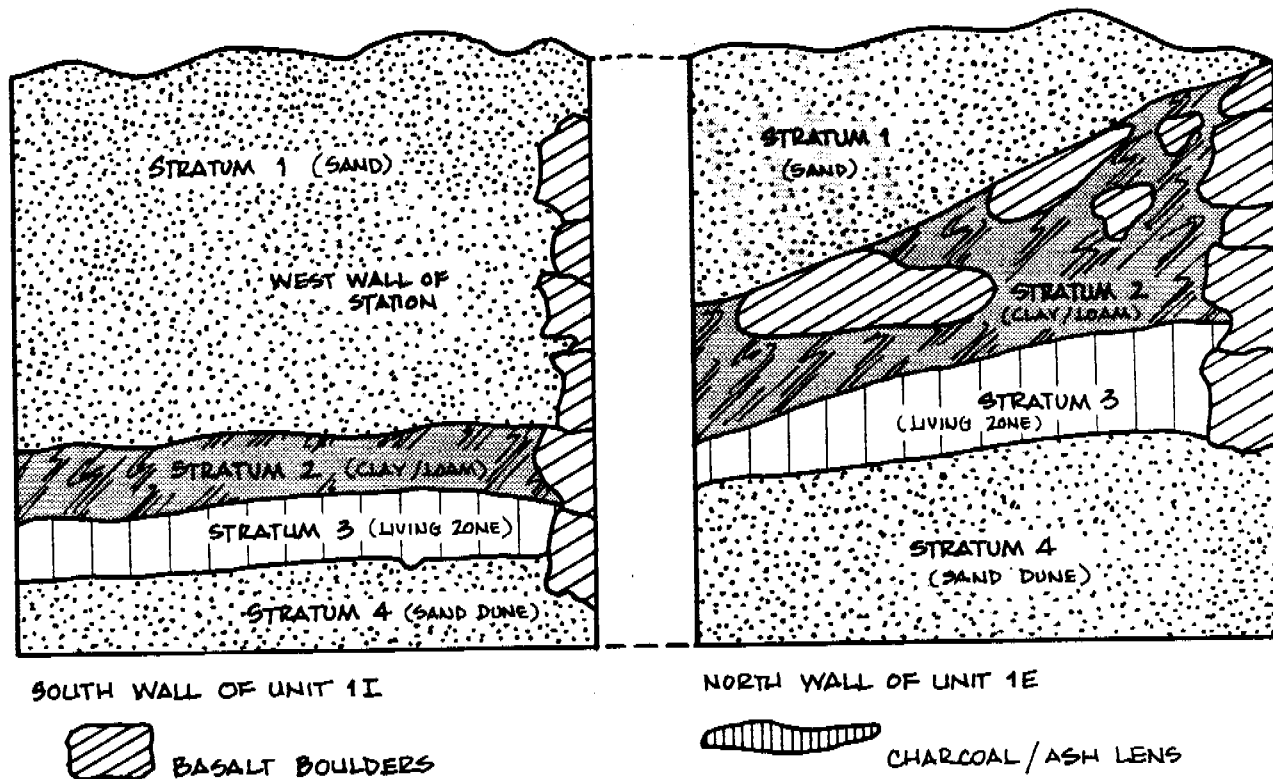
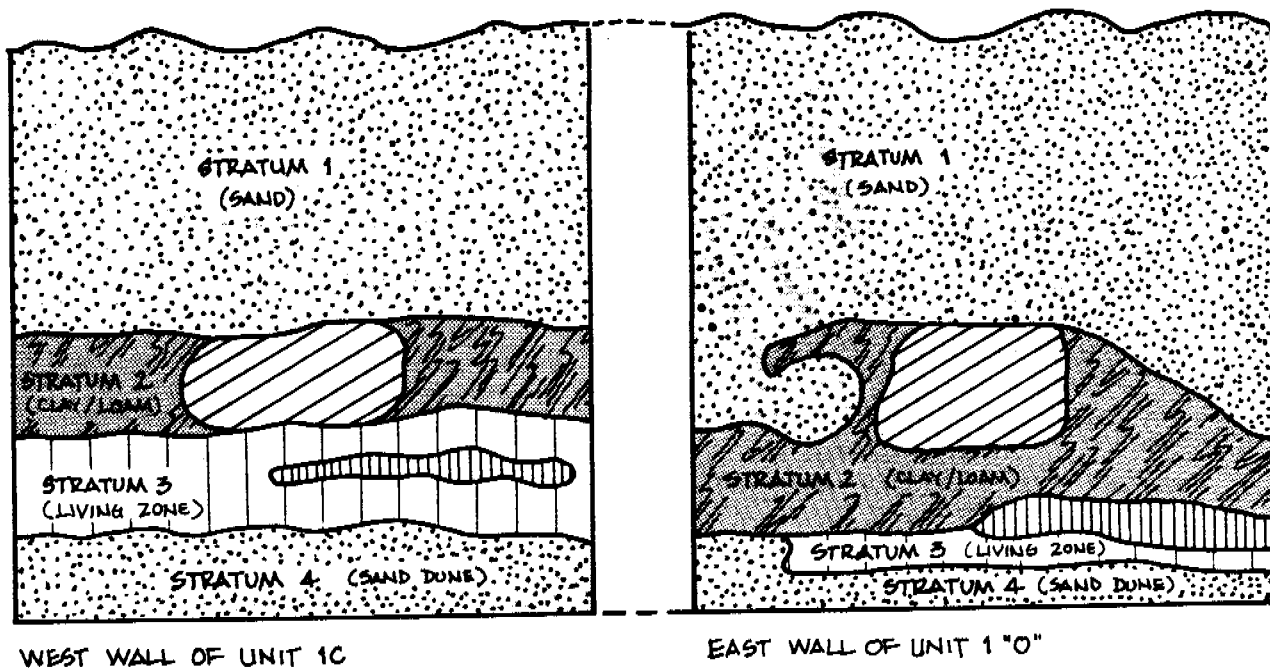


Figure 11. Stratigraphic Profiles of Room 1 at Sand Springs Station  
(Not to Scale)

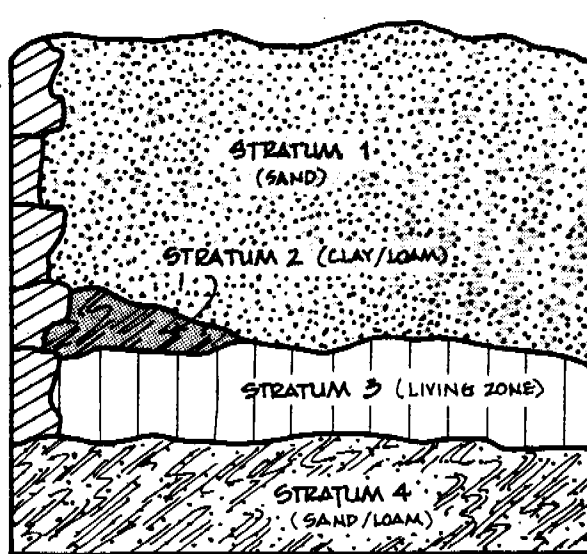
to light brownish gray (Munsell notation 2.5Y6/2 dry) sandy loam deposit with charcoal/ash lenses and a variety of artifacts. It lies directly below the daub deposit, stratum 2 and varies in thickness from one to eleven centimeters. In the vicinity of the fireplace in the southwest corner of the room, the charcoal/ash concentration is the densest, diminishing toward the center of the room. This suggests that the fireplace is its source, rather than a collapsed and burned roof. Although there is little evidence that Room 1 had a roof, a shingle-like wood fragment, unburned, was located near the northeast corner of the room. In addition, a wooden floor joist projected a few inches into the room from under the north wall, in the vicinity of the northwest corner; its top and bottom surfaces coincided with the top and bottom surfaces of the living zone. The joist is pine, 2 inches thick, about 5 inches wide, and extends under the wall a few inches into Room 6. A wooden floor suggests a roof.

Stratum 4 is the original sand dune upon which the station is constructed. It ranges in color from pale yellow (Munsell notation 2.5Y7/4) to light gray (Munsell notation 2.5Y7/2). A few artifacts and other cultural debris have apparently been "trampled" into this deposit but within a few centimeters it rapidly becomes sterile.

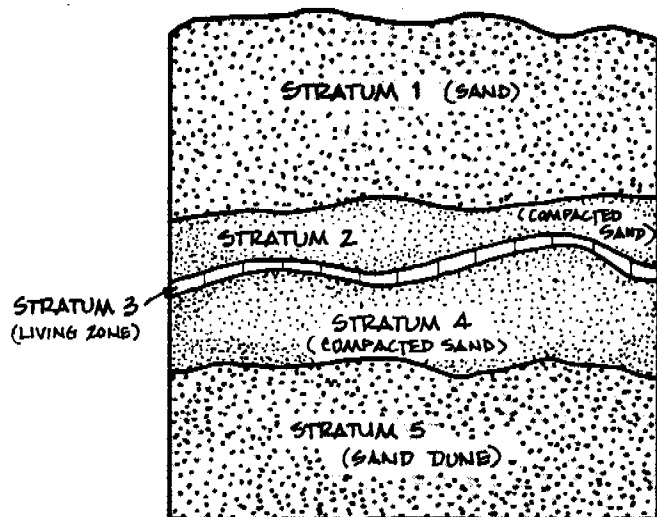
#### Room 2 (Figure 12)

Stratum 1 is a 1.5-2.0 meter thick deposit of white (Munsell notation 2.5Y8/2) to light brownish gray (Munsell

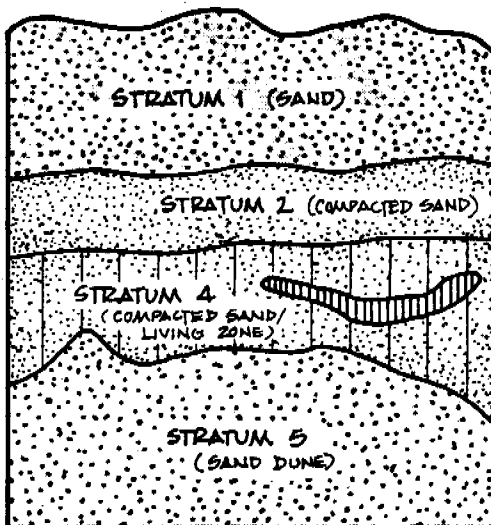
WEST WALL OF STATION



SOUTH WALL OF UNIT 3A



EAST WALL OF UNIT 2D



NORTH WALL OF UNIT 2N



BASALT BOULDERS



CHARCOAL / ASH LENS

Figure 12. Stratigraphic Profiles of Rooms 2 and 3 at Sand Springs Station (Not to Scale)

notation 2.5Y6/2) aeolian sand. As in Room 1, the deposit is bedded and is marked by an irregular and discontinuous band of coarse gray sand one foot or less above the living zone.

Stratum 2 is a light gray (Munsell notation 2.5Y7/2 dry) compacted fine sand deposit ranging from 1 to 5 centimeters in thickness. It lies directly upon the living surface but does not correlate with stratum 2, the daub layer, in Rooms 1, 3, and 6. Indeed, there is no evidence in the archaeological record that the walls in Room 2 are daubed at all. A few artifacts are associated with the compacted sand, and it is possible that stratum 2 is actually a living surface; however, it can be easily separated from the more loamy deposit with charcoal/ash inclusions lying directly beneath.

Stratum 3 is a discontinuous 9 centimeter thick deposit of compacted loamy sand with a light gray color (Munsell notation 2.5Y7/2 dry). It is a distinct but undulating stratum marked by charcoal inclusions and occurs only in the northwest corner of the room. The packing suggests that this part of the room was used more frequently, consistent with its position next to the doorways to Rooms 3 and 5. Stratum 3 definitely belongs to the living zone formed by human occupation.

Stratum 4 underlies stratum 2 in most parts of the room and stratum 3 in the northwest corner. Varying from 5 to 21 centimeters in thickness, stratum 4 is a compacted loamy sand deposit colored light gray (Munsell notation 2.5Y7/2 dry) to brown (Munsell

notation 10YR5/3 dry). Several thick charcoal/ash lenses are sealed into the deposit. Most of the artifacts recovered from stratum 5 are apparently due to "trampling" by the occupants of the room.

### Room 3 (Figure 12)

Stratum 1 is a 5-6 foot deposit of light gray (Munsell notation 2.5Y7/2 dry) to pale yellow (Munsell notation 2.5Y7/4 dry) aeolian sand overlying the living zone. As in the other rooms, it is distinctly bedded and marked by a thin bed of coarse gray sand representing an old dune surface. A few widely dispersed artifacts were located about a foot above stratum 2.

Stratum 2 is a discontinuous deposit of mixed clay/loam sediments with carbonate inclusions correlated with the daub stratum in Rooms 1 and 6. It is light gray (Munsell notation 2.5Y7/2 dry) in color, varies from 1 to 10 centimeters in thickness, and is distributed along the walls of the room. The deposit is thickest next to the wall and thins out toward the center of the room, gradually disappearing. As in Rooms 1 and 6, the origin of the daub layer is the gradual collapse of the daub plaster on the interior walls.

Stratum 3 is a 25-30 centimeter thick deposit of loamy sand with heavy charcoal/ash inclusions and colored light gray (Munsell notation 2.5Y7/2 dry) to gray (Munsell notation 7/5YR6/0 dry). It is compacted, especially in the vicinity of the well in the northeast sector of the room. The heavy compaction in this area

suggests constant use. Stratum 3 is filled with a wide variety of human refuse and defines the living zone of room 3.

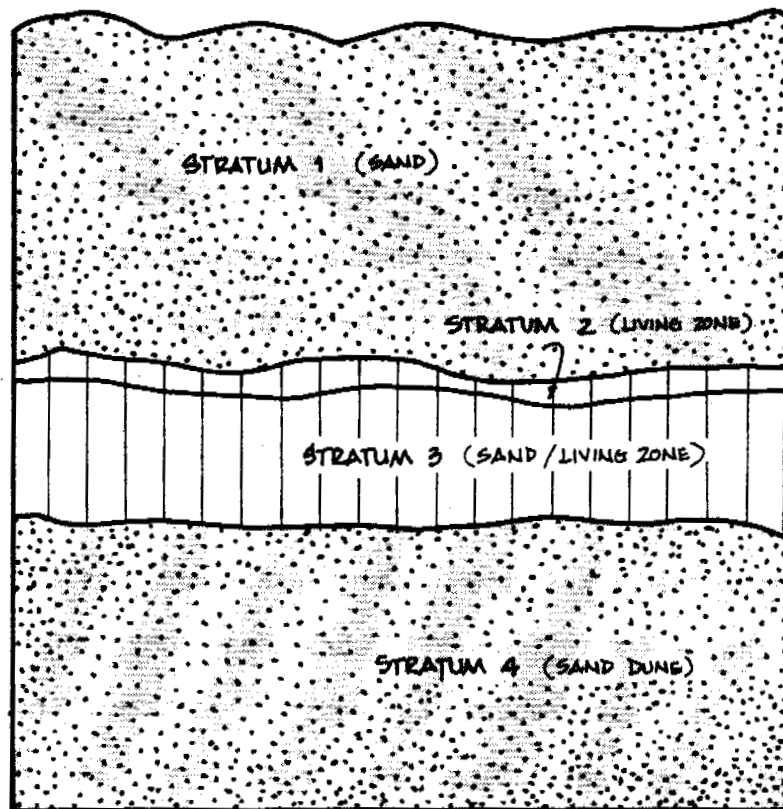
Stratum 4 underlies the living zone and contains few artifacts or other refuse. It is a loose to slightly compact aeolian sand with a light gray (Munsell notation 2.5Y7/2 dry) color.

#### Room 4 (Figure 13)

Stratum 1 is a 5-6 foot deposit of pale yellow (Munsell notation 2.5Y7/4 dry) aeolian sand overlying the living zone and correlated with stratum 1 from the other rooms at Sand Springs. It is distinctly bedded and marked by the coarse gray sand stratum observed elsewhere. Feature 2, part of a juvenile cow skeleton, 2 leather boots, and metal fragments, is in the northwest corner about 3-4 centimeters above stratum 2.

Stratum 2 is a pale brown (Munsell notation 10YR6/3 dry) to brown (Munsell notation 10YR5/3 dry) loamy sand deposit of human origin. It is compacted but pops off in thin sheets because of its high fiber content, suggesting horse manure. In comparison to the "manure" deposit in Room 5, stratum 2 is quite thin, varying from about 1 to 5 or 6 centimeters thick, and has a low fiber and organic composition. Most of the refuse associated with the stratum is animal bone. In general the archaeological record supports the hypothesis that this room was used as a corral.

Stratum 3 underlies the living zone and contains some artifacts probably due to "trampling." The deposit is loose to slightly compact aeolian sand colored pale yellow (Munsell notation 2.5Y7/4 dry). It represents the original dune upon which the



WEST WALL OF UNIT 12N1E

Figure 13. Stratigraphic Profile of Room 4 at Sand Springs Station  
(Not to Scale)

station was built.

Room 5 (Figure 14)

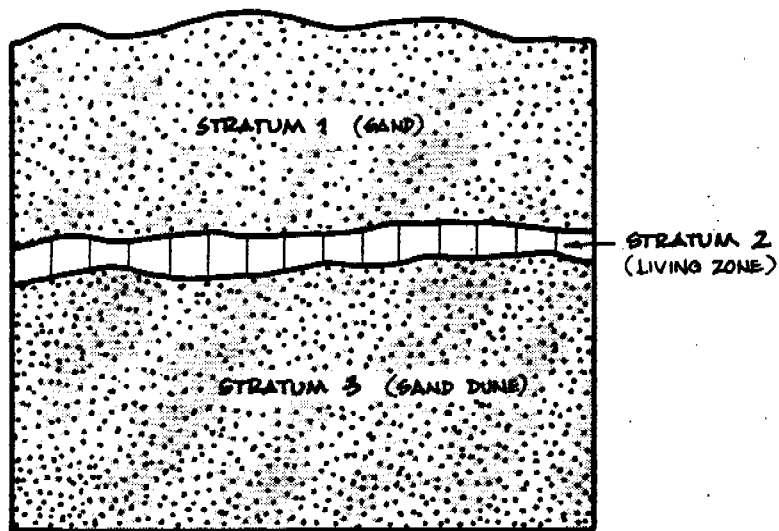
Stratum 1 is a 5-6 foot deposit of light gray (Munsell notation 2.5Y7/2 dry) to pale yellow (Munsell notation 2.5Y7/4 dry) aeolian sand overlying the living zone and correlated with stratum 1 in all of the rooms at Sand Springs. It is distinctly bedded, including the coarse gray sand marking an old dune surface. Several metal artifacts, all badly corroded, were located about 1 foot above the living zone. Most of the artifacts belong to the undercarriage of a wagon and probably originate with the 1908 prospectors occupation.

Stratum 2 is a 10 centimeter thick living zone made up of alternating thin layers of pink (Munsell notation 7/5YR8/4 dry) fine sand and dark reddish brown (Munsell notation 5YR3/3 dry) loamy sand with a high organic and fiber content. The stratum "pops off" the underlying deposit. A large amount of bone refuse is associated, along with a wide variety of artifacts. Stratum 2 appears to be accumulated manure into which human garbage has been dumped.

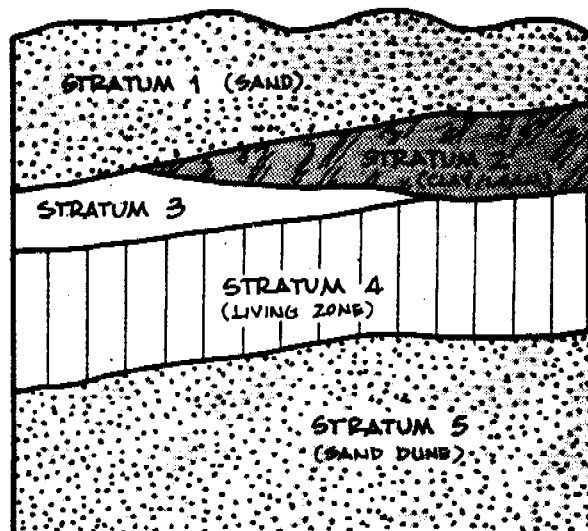
Stratum 3 underlies the living zone and is the original dune upon which the station was built. It consists of loose to slightly compact aeolian sand that has been stained by leaching from above, colored light yellowish brown (Munsell notation 10YR6/4 dry) just below stratum 2 to very pale brown (Munsell notation 10YR7/3 dry) somewhat deeper.

Room 6 (Figure 14)

Stratum 1 is a light gray (Munsell notation 2.5Y7/2 dry) aeolian



NORTH WALL OF UNIT 6K



WEST WALL OF UNIT 7E

Figure 14. Stratigraphic Profiles of Rooms 5 and 6 at Sand Springs Station  
(Not to Scale)

sand filling Room 6 from the floor to the top of the walls. As elsewhere, it is clearly bedded, including the coarse gray "marker" sand deposited on an earlier dune surface. The remains of a coyote were located just above stratum 2, along with a few unindentifiable metal fragments.

Stratum 2 is an undulating deposit of mixed clay/loam sediments with carbonate inclusions. It is correlated with the daub stratum of Room 1 and 3 and varies in color from light gray (Munsell notation 2.5Y7/2 dry) to yellowish brown (Munsell notation 10YR5/4 dry). Stratum 2 is about 20 centimeters thick when present but is discontinuous. Nevertheless, its quantity suggests that the walls in this room were plastered with a large amount of daub, an hypothesis supported by the amount still remaining.

Stratum 3 is a discontinuous layer of loose sand identical to stratum 1 that lies between stratum 2 and the living zone, stratum 4. Its occurrence simply indicates that blowsand accumulated upon the living zone before a major daub fall.

Stratum 4 is a grayish brown (Munsell notation 2.5Y5/2 dry) compacted sand with human origins. Charcoal inclusions and artifacts are associated, although uncommon. The top of the stratum is quite level but the bottom is extremely undulating, as if a substance had soaked through and penetrated to different depths. Two wooden floor joists about three feet apart extended from under the south wall a few inches into the room. The top and bottom of the

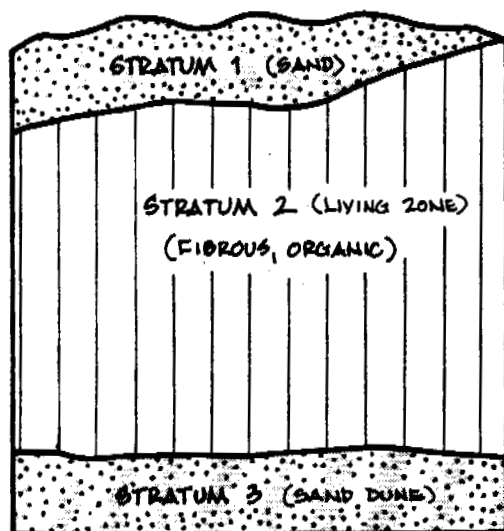
joists coincided with the top and bottom surfaces of the living zone, as was the case in Room 1.

Stratum 5 underlies the living zone and is the original dune. It is loose aeolian sand colored brownish gray (Munsell notation 2.5Y6/2 dry).

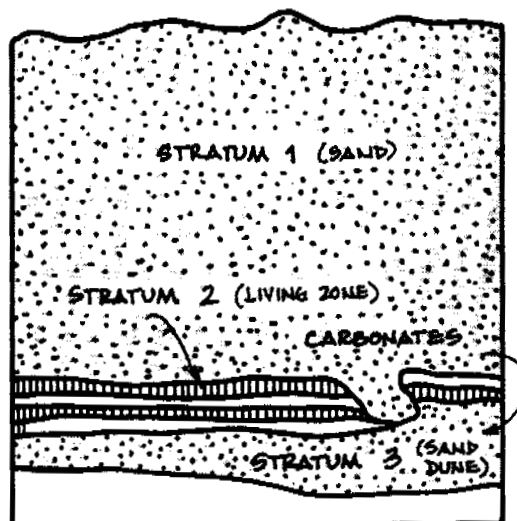
Outside (Figure 15)

Stratum 1 is the aeolian sand making up the sand dune covering the station and overlying the living zone defined just outside the walls. The deposit is colored light gray (Munsell notation 2.5Y7/2 dry) to pale yellow (Munsell notation 2.5Y7/4), with sporadic white (Munsell notation 10YR8/1 dry) inclusions. Bedding is distinct and several strata of coarse sand are found against the north wall. Some of these dip toward the wall, suggesting the formation of a dune farther away that is growing toward the wall. In fact this is what would be expected; since prevailing winds are out of the southwest, blowing sand would saltate ("jump") over the building and accumulate considerably north of it.

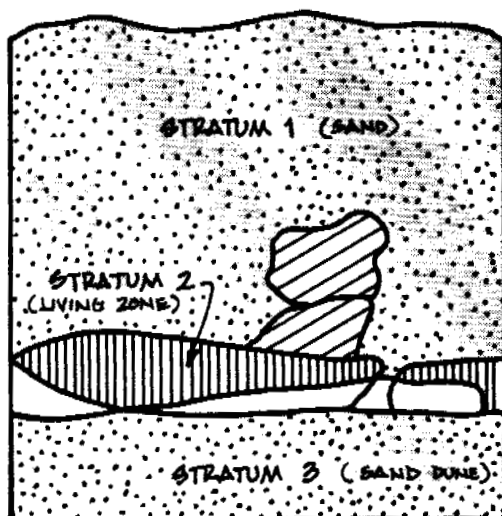
The coarse sand "marker strata" separate two periods of rockfall along the east wall at the southeast corner. One group of basalt boulders fallen from the wall lies upon the living zone. Directly overlying this rockfall is the coarse gray sand stratum. On top of the coarse sand are about two feet of fine to medium sand, in turn underlying a second rockfall. The stratigraphic record gives the distinct impression that some of the station walls collapsed rapidly shortly after abandonment, followed sometime



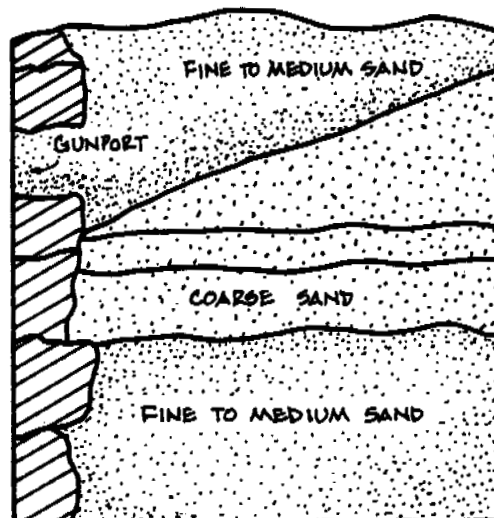
EAST WALL OF UNIT 5Z  
(PERIMETER OF STATION NORTH WALL)



NORTH WALL OF UNIT 5X  
(PERIMETER OF STATION SOUTH WALL)



SOUTH WALL OF UNIT 5A  
(PERIMETER OF STATION WEST WALL)



WEST WALL OF 5S, 5T, 5U  
(PERIMETER OF STATION NORTH WALL)



Figure 15. Stratigraphic Profiles Outside Sand Springs Station  
(Not to Scale)

later by another period of rapid collapse. Perhaps earthquakes, not uncommon in this region, are responsible? Bedding is also distinctive in stratum 1 outside the south and west walls of the building; however, in these areas the coarse "marker strata" dip away from the walls, suggesting that the dune accumulated directly against the building. This is consistent with prevailing winds out of the southwest. Two periods of major rockfall are also indicated here.

Stratum 2 is the living zone underlying stratum 1. On the south perimeter, it extends out about 5 meters from the wall and is 10-20 centimeters thick. The deposit is basically a light gray (Munsell notation 2.5Y7/2 dry) loamy sand with thick charcoal/ash lenses, sometimes separated by a fibrous, organic material, and sometimes with a high artifact content. It gives every appearance of a "dumping" zone for garbage, manure, and ashes from the fireplace. On the east and west perimeter, stratum 2 is neither as extensive nor as thick but has the same composition; however, the north perimeter is quite different. Here stratum 2 is a yellowish brown (Munsell notation 10YR5/8 dry) loamy sand with a high organic and fiber content. Near the intersection of the walls separating Rooms 4 and 5, the deposit is 1 to 1½ meters thick, has an extremely undulating surface, and extends about 3 meters out of the wall. Few artifacts are present, and wood and sand inclusions are common. It is quite clear that the origin of stratum 2 in this area is the dumping of accumulated manure from

Rooms 4 and 5.

Stratum 3 is a pale yellow(Munsell notation 2.5Y7/4 dry) to very pale brown(Munsell notation 10YR7/4 dry) loose aeolian sand underlying stratum 2. Its depth correlates closely with the bottom of the station walls, suggesting that it is the original dune surface.

#### COLD SPRINGS STATION

Cold Springs station is built upon an alluvial fan complex, 200 feet above a saddle between the Dixie Valley drainage system and that of Edwards Creek Valley. A perennial stream draining Pony Canyon on the west side of the Desatoya Mountains runs along the southern border of the site. The stream crosses a fault a few hundred meters above the site, at which point it leaves a "canyon" and runs on the surface of a geologically recent debris flow. Rhyolitic boulders, some as large as 2 meters in diameter, cover the surface of the flow. The flow is about 200 meters wide, begins where the stream leaves the canyon, and continues along the stream for approximately one kilometer. Surrounding the debris flow is a structurally complex alluvial fan of Quaternary age.

A northern desert shrub plant community covers the area and is dominated by Big Sagebrush(Artemesia tridentata), with grasses such as cheatgrass(Bromus tectorum) interspersed throughout; an occasional pinyon (Pinus monophylla) or juniper(Juniperous

osteosperma) is also found. The vegetation cover averages about 50 percent. Some changes in vegetation have taken place since the early contact period: perennial grasses probably dominated what is now mostly sagebrush and the pinyon-juniper treeline of the nearby Desatoya foothills may have advanced to a somewhat lower elevation.

The geological and vegetational features of the region, along with human activities, are reflected in the stratigraphic record of Cold Springs station. At the top is an "L" horizon of loose, undecomposed sagebrush litter, followed by a wind deposited stratum of fine sand; a "living zone" or stratum formed by human activities follows, made up of loamy sand interspersed with ash, fine sand, silt, and artifacts. A layer of decomposed gravel underlies the site. Stratigraphic variability within the station is discussed in the following paragraphs.

#### Room 1 (Figure 16a)

Stratum 1 is an "L" horizon made up of loose, undecomposed litter fall, lying upon the present ground surface. The associated artifacts could not be kept separate from those in the next stratum because of "trampling; that is, stratum 1 is a theoretical unit only and has no meaning for archaeological data collection.

Stratum 2 is "pothole" backdirt directly beneath the "L" horizon. For collection purposes, strata 1 and 2 are combined.

Stratum 3 is a 4-8 centimeter thick stratum of single-grained gravelly loamy sand with a light brownish gray color (10YR5/2D or

1 INCH = 50 CENTIMETERS

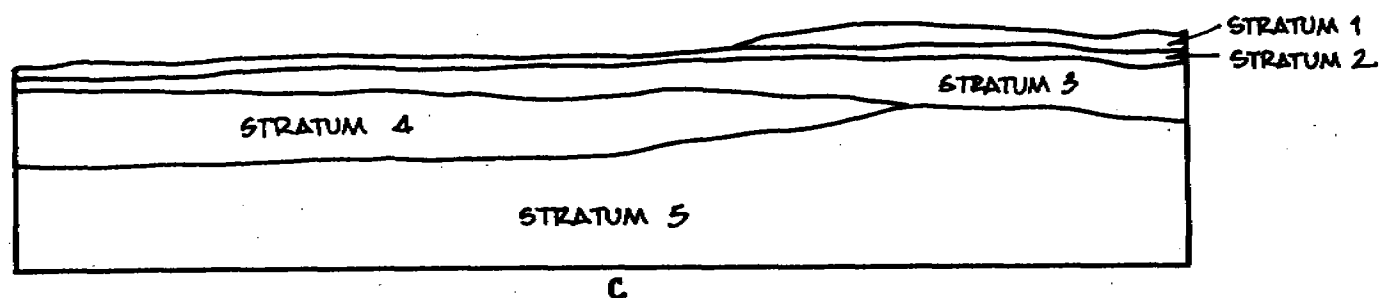
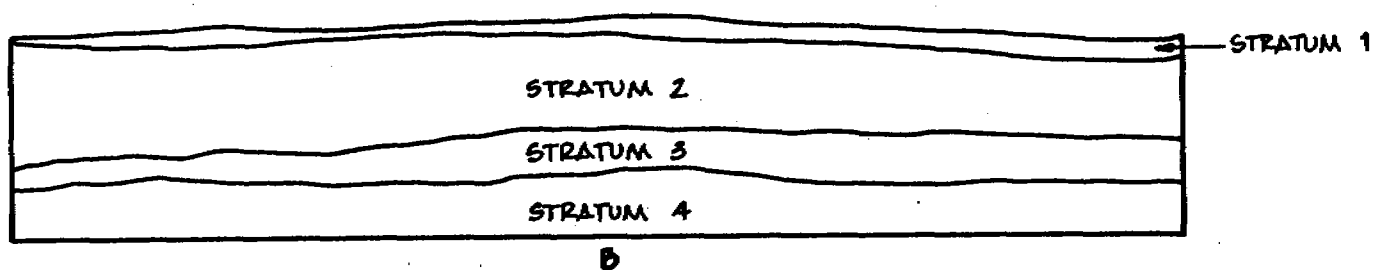
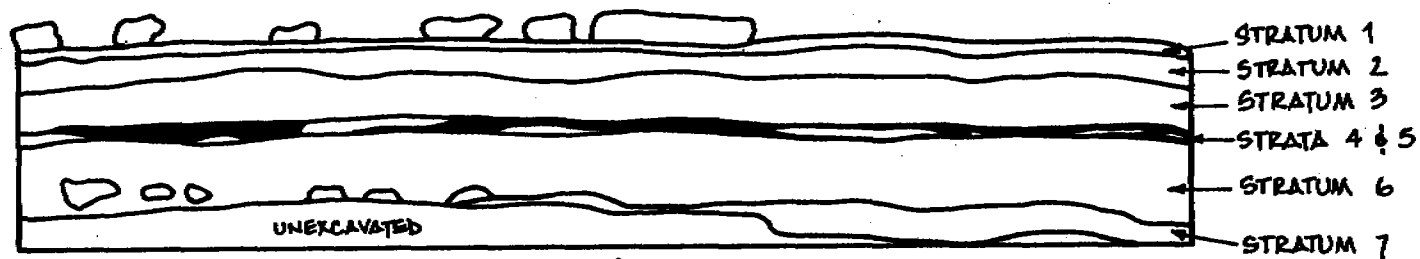


Figure 16. Stratigraphic Profiles of Rooms 1, 2 and 3 at Cold Springs Station

6/2 Munsell notation) underlying the backdirt. It is considerably more compacted than stratum 2 and appears to be the result of a collapsed "willow thatch" roof with a sand topping.

Stratum 4 is a thin deposit of charcoal-ash beneath stratum 3. The ash lies directly on a compacted, yellow clayish "floor" or on a thin brown stratum (stratum 5) lying on the floor. Burning and collapsing of a willow thatch roof is a possible explanation.

Stratum 5 is a thin brown deposit between ash and the "floor." The deposit is discontinuous and contained several artifacts and refuse. Compaction of the soil suggests that stratum 5 is "dirt" that has been trampled by humans walking over the floor.

Stratum 6 is a compacted pale yellow (10YR7/4D Munsell notation) clayey soil that breaks in large clumps to a light brownish gray (10YR5/2D Munsell notation) sandy deposit. This "mottled" deposit is fairly continuous throughout Room 1 and begins from 18 to 20 centimeters below the present ground surface. Although the color and texture of the deposit is similar to the wall chinking material, its thickness, artifact content, and compaction cannot be explained as wall fall. A thick deposit of loose sandy light brownish gray (10YR5/2D Munsell notation) soil sloping from north to south occurred directly below stratum 6. Rock fragments are included in the deposit, as are small compacted areas and several artifacts. However, artifact and refuse inclusions disappear 30 to 40 centimeters below the surface of stratum 5. Stratum 6 appears to be an earth fill used to level

a ground surface that slopes away from room 2 in a southerly direction toward the creek. The fill was either taken from an area used for garbage disposal or garbage was thrown directly into this area.

Stratum 7 is sterile subsoil, encountered 58-65 centimeters below the present surface and 33-41 centimeters below the floor.

#### Room 2 (Figures 16

Stratum 1 is an "L" horizon made up of loose, undecomposed litter fall, mostly from sagebrush, lying upon the present ground surface. In some places the horizon is 3 centimeters thick and contains several artifacts and refuse. As in Room 1, the stratum cannot be used for collection purposes because of mixing with the underlying aeolian sand caused by trampling.

Stratum 2 is a thin deposit of fine sand with a light brownish gray (Munsell notation 2.5Y6/2D) beneath the "L" horizon. The sand is deposited by aeolian action and ranges from 0 to 5 centimeters in thickness. Several artifacts were collected from the stratum and combined with those from stratum 1.

Stratum 3 is compacted deposit underlying stratum 2 composed of essentially the same kind of sand but with very thin, discontinuous lenses of ash and charcoal. The entire stratum is less than a centimeter thick and includes a large number of artifacts. Below this zone, artifact density falls drastically and a shift in soil characteristics occurs. Stratum 3 appears to be the original use surface in Room 2.

HORIZONTAL SCALE: 1 inch = 1.5 meters  
VERTICAL SCALE: 1 inch = 20 centimeters

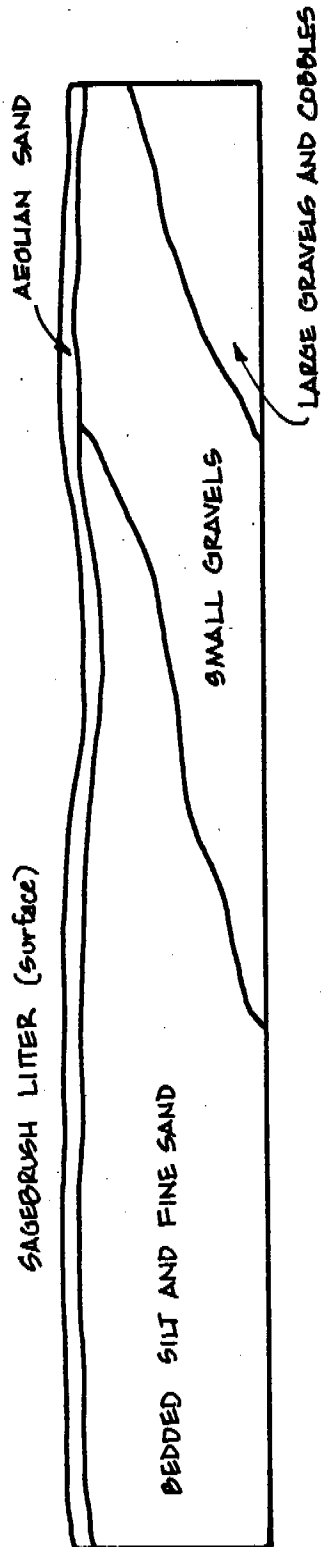


Figure 17. Stratigraphic Profile of Room 2, East-West Trench, at Cold Springs Station

Stratum 4 is a 10 to 15 centimeter deposit of bedded and cross-bedded fine to coarse sand and gravel with a pinkish color (5YR6/1D Munsell notation) directly beneath stratum 3. The deposit is interspersed with light brownish gray and pinkish white lenses of fine sand and silt, some containing charcoal fragments and refuse. Jonathan Davis (Nevada Archaeological Survey), the geologist serving as a consultant to the project, interprets this stratum as sheetwash from the upslope (eastern) part of Room 2 that has been deposited since the station was abandoned. The deposit is deepest in this part of the room because it is in a swale produced by an old stream channel. Postoccupation movement of archaeological debris into the lowest part of the room makes spatial studies of artifact and refuse distribution nearly worthless for reconstructing human activities.

Stratum 5 is a light brownish gray (2.5Y6/2D Munsell notation) soil composed of a loamy sand underlying stratum 4. The deposit is more compacted than stratum 4 and includes a high density of gravel and pebble size rocks, the density increasing with depth. Again this suggests an old stream bed.

Stratum 6 is a deep deposit of fine sand and silt with a light yellow color and about .5 meter wide originating in stratum 4 and continuing into stratum 5. The lens is boomerang-shaped, starting in the middle of the east wall of the isolated two-meter square, extending about one meter due west and then turning toward the southwest corner where it goes into the profile. Near

its surface, and at the middle of the square, stratum 6 is associated with a large rock.

Room 3 (Figure 16c)

Stratum 1 is a disturbed deposit of sandy loam (10YR4/3D color in the Munsell notation) spread over the present ground surface in the northwest corner of sub-operation A and extended south. The deposit comes from a large hole dug along the south wall of Room 3 sometime in the past.

Stratum 2 is an "L" horizon made up of sagebrush litter lying upon the present ground surface. It varies from 3 to 4 centimeters in thickness.

Stratum 3 is a slightly consolidated, fine aeolian sand deposit with a pale brown color (10YR6/3D Munsell notation) beneath stratum 2. It ranges in thickness from about 3 centimeters on the south side to nearly 15 centimeters on the north. Most of the artifacts recovered from Room 3 are from this stratum.

Stratum 4 is a discontinuous 15 to 20 centimeter thick deposit of fibrous, internally stratified material. It is brownish (10YR 4/4M to 7.5YR3/4M in the Munsell notation) with yellow (10YR7/4D) flecks and mottled appearance. Stratum 4 overlies stratum 3, is the thickest toward the south wall and tapers out toward the north. We concluded in the field that this is horse manure and chemical analysis supports this interpretation (see below). The presence of this deposit suggests that Room 3, at least on the west end, was used as a stable. Additional deposits of fibrous material were also located just outside the west wall of Room 3, indicating that

accumulated manure was thrown out the window and/or door. Consolidation of stratum 4 suggests trampling and indicates that the top of this deposit is the original use surface.

Stratum 5 is a compacted gravelly deposit containing very few artifacts. The top of this deposit appears to be the original use surface in all areas of Room 3 except where stratum 4 occurs.

#### Outside

Stratum 1 is litter and aeolian blowsand to a depth of about 5 centimeters. It is loose, contains about 10 percent pebbles and is a light brownish gray color (10YR6/2D Munsell notation). A wide variety of artifacts is associated, including nails, metal fragments, glass, lithics, ceramics, wood, and rodent or rabbit bones.

Stratum 2 is a silt layer with intercalated lenses of loose, charcoal flecked, dark brown (10YR4/3D Munsell notation) soil and moderately compacted brown (10YR5/3D Munsell notation) soil with dense, cohesive organic matter similar to that in Room 3. The stratum is only about 5 centimeters thick, associated with a wide variety of artifacts, and rapidly fades out toward the east end of the excavation unit. Its existence supports the hypothesis that refuse was dumped in a "sheet" just outside the station's walls.

Stratum 3 is grayish brown (10YR5/2D Munsell notation) gravelly soil underlying stratum 2, and except for one nail fragment, is sterile.

## A TRASHY EXPOSE OF LIFE IN A PONY EXPRESS STATION

Sir Richard Burton was less than impressed with the amenities of life and the caliber of employee at Cold Springs and Sand Springs station. Recall that at the former, "the four boys, an exceedingly rough set, ate standing, and neither paper nor pencil was known amongst them" (Burton 1862: 487). But Sand Springs, in the eyes of this British aristocrat, was really the pits!

The station house was...roofless and chairless, filthy and squalid, with a smoky fire in one corner, impure floor; the walls open to every wind, and the interior full of dust. Hibernia, herself, never produces aught more characteristic. Of the employees, all loitered and sauntered about desoeuvre's as cretins except one, who lay on the ground crippled and apparently dying by the fall of a horse upon his breast bone. (ibid., p. 491).

Notwithstanding Burton's ethnocentrism, his general picture of life in a pony express station on the western frontier is similar to that portrayed in other documents and is probably correct. What is missing, however, are the details of day to day behavior. The documents give little information about how the attendants were clothed, what they ate and drank, the activities that they performed during a normal day, and the like. Here is where archaeological evidence can best be used. Despite the problems with reconstructing human behavior from refuse, mentioned earlier, a wide variety of general clues can be disinterred

from artifacts left behind. They can be used not only to add details missing in documents but also to help verify the accuracy of statements made by Burton and his contemporaries. Where are the clues to be found? One kind can be found in the inferred use or function of artifacts.

The artifacts left behind at the two pony express stations can be classified into the categories of use shown in Table 8. Most of the categories are in some way related to household activities or to personal habits, such as food preparation and consumption, drinking, and clothing. The high representation of these artifacts is to be expected, of course, because of their probable low value to the station attendants and to their breakability; that is, they are broken and thrown away more often than other kinds of artifacts, causing their common occurrence in the archaeological deposits. It does not necessarily imply that the station was centered upon household and personal activities, but that artifacts connected with other kinds of activities were more highly valued or less breakable or both and were, consequently, not thrown away as often. With that caveat in mind, let us turn to the activities implied by the artifacts.

#### HOUSEHOLD ACTIVITIES

The largest proportion of artifacts that could be identified by use are somehow related to household activities. Those artifact categories include dishes, utensils, drinking glasses, cans, condiment bottles, cast-iron pots, buckets, and the like.

TABLE 8

FUNCTIONAL AND STYLISTIC CLASSIFICATION OF ARTIFACTS FROM  
SAND SPRINGS AND COLD SPRINGS STATIONS

USE CATEGORIES	STYLISTIC TYPES	FREQUENCY	
		<u>Sand Springs</u>	<u>Cold Springs</u>
I. Household			
A. <u>Dishes</u>			
1. Plates, ironstone/ whiteware	a. Undecorated	4	1
	b. Painted blue rim	19	
	c. Impressed flower/ leaf	12	
	d. Scalloped rim	3	
	e. Transfer print	1	
2. Saucer, ironstone/ whiteware	a. Undecorated	3	
	b. Impressed sections	10	
3. Serving dishes, ironstone/whiteware undecorated		5	
4. Cut glass bowls		3	
5. Teapot, polychrome spout, stoneware		1	
6. Unidentified fragments			
	a. Ironstone/whiteware, undecorated	271	42
	b. Ironstone/whiteware decorated	11	4
	c. Redware, exterior glazed	4	279
	d. Albany glaze	4	1
B. <u>Utensils</u>			
1. Spoons		3	1
2. Knives		1	
3. Unidentified bone utensil handles		2	

USE CATEGORIES	STYLISTIC TYPES	FREQUENCY	
		<u>Sand Springs</u>	<u>Cold Springs</u>
C. <u>Condiment Bottles</u>			
1.	Pickle or peppersauce	18	9
2.	Barrel mustard	1	6
3.	Worcestershire sauce, Lea and Perrins	1	
4.	Spice	58	
D. <u>Canned Food Containers</u>			
1.	Corned beef		1
2.	Sardines	1	
3.	Unidentified contents		
	a. Open-top		15
	b. Hole-in-the-top		3
E. <u>Miscellaneous Household Artifacts</u>			
1.	Large brass lid	1	
2.	Cast-iron cooking pot		1
3.	Iron stove fragments	3	
4.	Buckets	1	2
5.	Barrel hoops		2
6.	Mano	1	
7.	Metate	1	
II. PERSONAL			
A. <u>Clothing</u>			
1.	Buttons	47	10
2.	Shoes, leather	13	3

USE CATEGORIES	STYLISTIC TYPE	FREQUENCY	
		<u>Sand Springs</u>	<u>Cold Springs</u>
	3. Straight pins, brass	2	
B.	<u>Grooming</u>		
	1. Hair or beard combs, vulcanite	36	2
	2. Delicing combs, bone		2
	3. Hair pins, vulcanite	1	
	4. Mirrors		1
	5. Shaving mugs, ironstone/whiteware		
	a. Round, ring-base	1	1
	b. 8-sided	16	
C.	<u>Adornment</u>		
	1. Beads	6	1
D.	<u>Tobacco Pipes</u>		
	1. Stemmed "Dublin"	3	
	2. Unstemmed		
	a. Glazed, pimpled	8	
	b. unglazed		
	1. undecorated	1	
	2. human head bowl		
	a. headband	4	
	b. no headband	1	
	3. Unidentified	2	
E.	<u>Patent Medicine Bottles</u>		
	1. F. Brown's Essence of Jamaica Ginger	1	
	2. Catawba wine bitters	17	
	3. Merchant's gargling oil liniment	2	
	4. Davis vegetable pain killer	2	
	5. Unidentified medicinal	2	

USE CATEGORIES	STYLISTIC TYPE	FREQUENCY	
		<u>Sand Springs</u>	<u>Cold Springs</u>
F. <u>Alcoholic Beverage Bottles</u>			
1. Wine or champagne		28	8
2. London jockey clubhouse gin		5	
3. Ale or brandy		1	3
4. Beer or whiskey			1
G. <u>Miscellaneous Personal Artifacts</u>			
1. Chinese coin		1	
III. COMMUNICATIONS			
A. <u>Writing</u>			
1. Pen points			2
2. Ink bottles			4
3. Graphite lead fragments		3	
4. Stamps		2	
B. <u>Telegraph Equipment</u>			
1. Telegraph insulators, vulcanite		3	
2. Key resister wire fragments		11	
IV. WEAPONS			
A. <u>Percussion caps</u>		28	5
B. <u>Slugs</u>			
1. Minie balls			
	a. .56 cal., rifled	4	
	b. .65 cal., smooth	1	
2. Conical or picket balls			

USE CATEGORIES	STYLISTIC	FREQUENCY	
		<u>Sand Springs</u>	<u>Cold Springs</u>
	a. .31 cal., smooth	1	
	b. .38 cal., smooth	1	
	c. .44 cal., rifled	2	
3. Round balls			
	a. .31 cal.	5	
	b. .344 cal.		1
	c. .38 cal.	5	
	d. .38 cal. revolver	1	
	e. #1 birdshot	1	
4. Unidentified		2	2
C. <u>Brass casings</u> , unidentified caliber		2	
D. <u>Ramrods</u>		1	
E. <u>Projectile Points</u> , Lithic			
	1. Humboldt Concave Base A	1	
	2. Eastgate Expanding Stem	1	
	3. Unidentified	1	2
V. LIVERY			
A. <u>Animal Shoes</u>			
	1. Horseshoes	15	3
	2. Ox shoes	3	
	3. Mule shoes	4	
	4. Nails		21
B. <u>Tack</u>			
	1. Harness buckles	2	
	2. Harness or belt fastener	1	
	3. Harness or belt fragments, leather		1

USE CATEGORIES	STYLISTIC TYPE	FREQUENCY	
		<u>Sand Springs</u>	<u>Cold Springs</u>
C. <u>Wagon Parts</u>			
1. Undercarriage		1	
2. Box spring		1	
3. Box bracket		1	
4. Wheel hub		1	
VI. ARCHITECTURE AND CONSTRUCTION			
A. <u>Fasteners</u>			
1. Nails			
	a. Wrought, common		
	1. Rosehead		
	a. 6d		1
	b. 10d		2
	c. 12d		1
	2. Flathead fragment		1
	3. T-head, 2d		2
	b. Cut, common		
	a. Stamped flathead		
	a. 6d		2
	b. 7d		1
	c. 8d		10
	d. 9d		3
	e. 10d		15
	f. 12d		4
	b. Wrought rosehead fragment		2
	c. Cut, finishing		
	a. 3d		2
	b. 6d		1
	c. 9d		1
	d. Unidentified fragments 5		116
2. Tacks, upholstery			4
3. Screws			
	a. Die cut		1
	b. Wrought		1

## USE CATEGORIES

## STYLISTIC TYPE

## FREQUENCY

Cold  
SpringsSand  
SpringsB. Door Handles

1

2

C. Wooden Wedges

2

D. Window Glass

53

Almost all of the identifiable dishes came from Sand Springs station; the only exception is an ironstone-whiteware plate fragment, undecorated, from Room 2 at Cold Springs. The reason is not, however, a difference in the activities of the pony express attendants, but a difference in the exposure of the two sites to relic collectors. Unlike Cold Springs, Sand Springs was buried and inaccessible. Again we encounter the problem of translating the archaeological record into the behavior that it represents.

The classification of dishes in the Sand Springs Collection is based upon shape, size, material, and decoration, in decreasing order of importance. Thus, "plates," "saucers," and "bowls" are shape categories. Plates are defined as circular and relatively flat containers of large size, at Sand Springs approximately 12 inches in diameter (no exact measurements are possible since all of the plates are broken). The 39 plate fragments in the collection are all ironstone-whiteware with a ring base, double booge, concave marly, and rounded rim, and fall into 5 decorative categories. Only 4 are undecorated; 19 have a painted blue rim on the marly. Several plates have an impressed design, the most common of which is a leaf and stemmed bulb or flower alternating with each other around the marly. The other plates with an impressed design have a scalloped rim, a series of rounded projections along the edge of the plate. Finally, a single plate has a red transfer printed floral design on the cavetto;

the design may also extend to the marly but that part is missing.

Saucers are similar in shape to the plates but are distinguished by their smaller size and small, shallow cavetto for the cup. Only two saucers could be reconstructed from fragments. One has a double concave marly, a double convex booge, and a ring base; the outermost marly is divided into "orange slices" by a series of vertical impressed lines. The other saucer has a single convex booge, a concave marly, a ring base, and no decoration. Both saucers are ironstone-whiteware, and both have maker's marks: the impressed saucer was manufactured by W. Davenport and Company, Longport, England, in 1860. William Adams, Tunstall, England, made the other; the date is uncertain but Gooden (1964:22) states that the word "Tunstall" does not appear on the marker's mark until 1896, and the word appears on the Sand Springs example.

The only nearly complete bowl is an oval serving dish with no foot, a convex booge, a concave marly, and a cavetto, it is undecorated ironstone-whiteware.

In addition to the dishes, 6 metal or metal and bone utensils are from Sand Springs. Two are table knives, neither of which is complete. A broad, flat steel blade with the handle missing was recovered from Room 2; it is 1 1/16 inches wide and 6 inches long (with the tip broken off). A bone handle to a knife was found close to the blade in Room 2 and, although it too is badly corroded to be sure, it is possible that the two fit together. The handle is made of two bevelled bone pieces attached to the tang of the blade

with two copper rivets. It is 3/4 inch wide and 3 3/4 inches long, including the top of the blade. A small section of bone handle, also from Room 2, is in the collection but it could not be definitely identified; it may belong to a knife, fork, or spoon. Finally, a complete spoon and two spoon fragments were recovered. The complete spoon comes from outside the building, is made of pewter, and has the raised words "C. Parker and Co." on the back of the handle. It was manufactured about 1850 by Charles Parker and Company, Meriden, Connecticut (Thorn 1949: 273). The only design on the 5 1/2" long teaspoon is a raised shell on the blade where it is attached to the handle. Both spoon fragments, one a handle and the other a blade, are from Room 2 and may be part of the same spoon. The fragments are silver electroplated britannia metal or nickel, undecorated, and exactly the same size as the pewter spoon. The manufacturer could not be identified.

A single pewter spoon handle, undecorated, was found at Cold Springs, associated with the plate in Room 2.

Condiment bottles made up over 50 percent of all the bottles that could be identified at Sand Springs, including pickle or peppersauce jars, mustard jars, worcestershire sauce bottles, and spice bottles. Eighteen pickle or peppersauce jars were collected; most of these probably came from a single jar in Room 2. One fragment of a barrel mustard jar and a glass stopper from a Lea and Perrin worcestershire sauce bottle were also found in Room 2.

Spice bottles, containing a variety of substances such as pepper, ginger, and cinnamon, were by far the most common condiment bottle in the Sand Springs refuse; 57 fragments and one complete bottle were discovered. Five of these from Room 4 are embossed with the words "Hunnewell, Boston," identifying a mid-19th century manufacturer.

The contrast with Cold Springs station is significant. There, only 6 fragments of barrel mustard jars and 9 fragments of a pickle or peppersauce jar could be located. The fact adds support to documentary evidence that a family once lived at Sand Springs (Bender 1958: 171) or that the building was used as a stage stop after the pony express occupation or both. In both cases cooking would have been a more important household activity, and a greater use of condiments would be expected.

The only other kind of food container located at the pony express stations are tin cans, and the contents of few of these could be definitely identified: an oval corned beef can at Cold Springs and a badly corroded sardine can at Sand Springs. What remains have been classified by manufacturing technique, shape, and size. Fifteen cans or parts of cans from Cold Springs are manufactured with a soldered top that can be removed by "unwinding" a perforated strip around the can. Although the first patent for such open-top cans was taken out in 1833, the open-top can was not common until the latter part of the 19th century (Fontana and Greenleaf 1962: 72). All but one of the

opentop cans in our collection are cylindrical, 2 to 4 inches in diameter, and 3 to 5½ inches high; the exception is an oval lid, possibly from a corned beef tin. Three other cans, also from Cold Springs, are manufactured with tops that cannot be removed. The cans were filled and the lid soldered on, leaving only a small hole in the middle. The matchstick size hole was finally soldered after the can had been heated, thereby vacuum sealing the contents. Hole-in-the top cans were used throughout the 19th century, but were gradually replaced by the open-top cans (ibid., pp. 68-69). Those in our collection are cylindrical, 3 to 3½ inches in diameter, and 4 to 4½ inches high; however, a top fragment is oval and may have come from a corned beef can.

Both of the above can types have soldered seams and can be easily identified as 19th century in age. Several other post-1932 crimped-seam cans were recovered from the surface of both Cold Springs and Sand Springs but are not considered here.

A few other rare artifacts could also be identified as related to household activities. A large brass lid, possibly from an oval cooking pot, 3 fragments of an iron stove door, and a metal bucket were recovered from Sand Springs; and a small fragment of a cast-iron cooking pot, 2 metal bucket fragments, and 2 barrel hoops were found at Cold Springs.

#### PERSONAL ACTIVITIES

Other than household activities, the most common behavior that could be inferred from the Cold Springs and Sand Springs

artifacts has to do with personal habits. The artifact categories included are clothing apparel, grooming, adornment, tobacco pipes, alcoholic beverages, medicines, and coins. Buttons are the most common item of clothing in the Cold Springs and Sand Springs collection. Here they have been classified by structure, method of manufacture, material, shape, size and decoration, combining the methods of Kirk (1976), South (1977: 92), and Stone (1974: 45) and following the approach used for the Fort Churchill, Nevada collection (Hardesty 1978b). Both South and Stone use the class as the starting point but South's functional definition is used here in lieu of Stone's structural definition; that is, all buttons belong to the same class because they are used to fasten clothing, or for ornamental purposes. The class is divided into series by structural and technological differences. For example, buttons that have only a single element, such as those cut from bone or shell, belong to the same series, while those of composite manufacture, with several elements, belong to another. Series are, in turn, divided into styles. Variation in button shape and size is used to distinguish one style from another, such as small and hemispherical as opposed to large and flat in cross-section. Finally, buttons are separated into types and variants by differences in material, decoration, and minor differences in shape. The actual classification is given in Table 9.

TABLE 9

## Buttons and Their Classification

Sand Springs				Cold Springs		
<u>Button Type</u>	<u>Cat.#</u>	<u>Dia.</u>	<u>Total</u>	<u>Cat.#</u>	<u>Dia.</u>	<u>Total</u>
1A1a	2221	.44	11	250	.40	2
	2226-1	.45		346-1	.43	
	814-3	.42				
	2226-2	.43				
	30	.42				
	1010	.43				
	2004	.43				
	2194	.37				
	814-1	.36				
	814-2	.37				
	562-1	.37				
1A1b	111	.43	2			0
	932	.44				
1A1c	2227	.57	1			0
1A2a	2271-1	.61	8	291	.53	2
	999	.57		346-2	.55	
	2271-2	.61				
	2231	.54				
	46-1	.54				
	535-1	.50				
	682	.54				
	756	.59				
1A2b	2225	.39	5			0
	535-2	.35				
	424	.33				
	46-2	.33				
	172-2	.31				
1A3	562-2	.68	4			0
	2270	.65				
	907	.57				
	46-3	.64				
1A4	182	.32	1			0
1B1			0	228	.45	1
1B2	712	.28	1			0
1C1	2130	.53	1			0

# Sand Springs

# Cold Springs

<u>Button</u>	<u>Type</u>	<u>Cat.#</u>	<u>Dia.</u>	<u>Total</u>	<u>Cat.#</u>	<u>Dia.</u>	<u>Total</u>
1C2		897	.69	1			0
1D1		70	.38				0
1D2		2256	.40				0
2A1				0	76	.58	1
2A2		215	.67	1	97	.52	1
2B		172-1	.88	1			0
2C1		924-1	.58	6	346-3	.86	1
		924-2	.62				
		924-3	.62				
		637	.58				
		2252	.61				
		450	.63				
2C2		2272	1.04	1	139	1.00	1
2D		46-4	.55	1			0
2E				0	84	.45	1
TOTAL				47			10

## I. Series 1. One-Piece Buttons

Most of the buttons in the collections have a single element and are manufactured by cutting shells or bone or by molding porcelain or vulcanite. These form the first series. Attachment is by sewing thread through holes drilled or otherwise formed into the button. The small size of the buttons suggests that they were used on shirts, blouses, and underwear.

A. Style 1A. The most common style in the first series is defined by a round shape, a flat to plano-convex cross section, and a circular sunken panel in one side through which holes have been drilled. None is decorated.

1. Type 1A1. The largest number of buttons is porcelain, small size (less than .50 inch in diameter), and flat in cross-section. Three color variants have been defined:

- a. Variant 1A1a. White.
- b. Variant 1A1b. Green.
- c. Variant 1A1c. Black. This button is also medium rather than small size.

2. Type 1A2. A similar button is cut from shell, is medium size (.50 to 1.00 inch in diameter), and is also flat in cross-section. There are no distinct color variants but color ranges from silver-white to silver-gray. Two size variants have been defined, however:

- a. Variant 1A2a. Medium size.
- b. Variant 1A2b. Small size.

3. Type 1A3. A few buttons in Style 1A are cut from bone,

are medium size, and flat in cross-section. Colors vary slightly around a light brown.

4. Type 1A4. A single black button from Sand Springs is small size with one flat side and a steeply convex, almost conical, side with a deep sunken panel. The button is probably made from porcelain.

B. Style 1B. Two buttons, one from each of the collections, are identical to style 1A with the exception that the sunken panel is replaced by a "fisheye" or a groove. The buttons of this style are small size and have a round shape, a flat cross-section, and 2 holes drilled through the recessed center, and are undecorated. Two types have been defined:

1. Type 1B1. A single button from Cold Springs is white porcelain with a groove or a squared-off fisheye on one side.

2. Type 1B2. A button from Sand Springs is cut from shell with a fisheye panel.

C. Style 1C. Another two buttons have distinct "rims" around the outer edge on one side but are otherwise the same as style 1A; that is, they have a round shape, a flat cross-section, and are drilled through the center. In effect, the sunken panel extends to the very edge of the button. Both are medium size but there are two types defined by material differences:

1. Type 1C1. The only representative of this type is from Sand Springs and is broken. It is made from white porcelain and has 4 center holes.

2. Type 1C2. Another button from Sand Springs is molded from vulcanite and has 2 holes for fastening. Embossed letters are found on both sides. One side reads "Martin and Bros., Clothiers;" the other reads "Goodyear's N.R. Co., Pat. 1851."

D. Style 1D. The final style in series 1 is defined by the presence of decoration. Buttons in this style are small size and have a round shape, a flat cross-section, no sunken panels, and 4 holes drilled through the center for fastening. Both examples are from Sand Springs and are cut from shell. Two types have been defined by differences in decoration:

1. Type 1D1. This style is defined by an engraved "swirl" pattern on one side of the button.

2. Type 1D2. An engraved "star" pattern on one side of the button is the other decorative type in style 1D.

## II. Series 2. Composite Buttons

Several buttons recovered from Sand Springs and Cold Springs have complex structures with more than a single element. The most common structure is separate back, crown, filler, and eye elements with the crown crimped to the back and the eye inserted into a hole through the back; however, a number of distinct styles have been defined. Most of the composite buttons are round, medium size, flat or hemispherical in cross-section, and metallic.

A. Style 2A. A few medium size buttons are made from 2 round disks of metal fastened together by crimping the crown over the

base. Four holes are drilled through the center and the cross-section is flat with a slightly depressed crown formed by stamping. This button is commonly used on trousers and was extremely abundant in the archaeological record at nearby Fort Churchill (Hardesty 1978b: 140, style 2C). Two types are defined by material differences:

1. Type 2A1. A single button from Cold Springs is made from white metal.

2. Type 2A2. One button from each site is made from brass.

B. Style 2B. A semihemispherical button molded from vulcanite was recovered from Sand Springs. A single vulcanite element forms the crown and back, and twisted iron (?) wire embedded into the back forms the eye element. The back has a sunken panel upon which are embossed the words "Goodyears N.R. Co., Pat." Buttons of this kind are typically used on coats.

C. Style C. The largest number of composite buttons is flat with a fabric covered crown and an eye element inserted through a hole in the back. No further information about the eye element is available because either the eye element is completely missing or it is too badly disintegrated to study details. Both crowns and back are separate elements and made from a white metal. The crown is crimped to the back. Two types are defined by size variation:

1. Type 2C1. Six buttons of this style from Sand Springs and one from Cold Springs are medium size.

2. Type 2C2. One button from each of the collections is

large size

D. Style 2D. A single fabric-covered metallic button from Sand Springs has a flat crown but a semihemispherical back. Because of corrosion, it is impossible to give details about the method of attachment. The button is medium size and has a crown element crimped to the back.

E. Style 2E. A fabric covered hemispherical (domed) button with a crown crimped to the back and a separate eye element (missing) is in the Cold Springs collection. The button is small size and may have been used as a coat button or as a cuff link.

Other than buttons, the most common clothing apparel at the two pony express stations were shoes. Although only 3 small fragments were recovered at Cold Springs, 13 nearly complete shoes, soles, heels, and other shoe parts were found at Sand Springs; most are from Room 2, but the only complete shoes came from Room 4. Two brass straight pins from Sand Springs are the only other clothing items located.

Despite the remoteness of the pony express stations on the western frontier, personal grooming was important: combs, shaving mugs, mirrors and hair pins were all located in their trash. Combs are the most common. Several hair or beard combs, made from vulcanite (hard rubber), were found at both stations, including one spine fragment from Cold Springs embossed with the words "omb Co Goodyears Paten" and a similar one from Sand Springs with the words "Goodyear's May 6, 1851." Both were

manufactured under Goodyear's original patent of 1851. In addition to these, two comb fragments from Room 1 at Cold Springs are double-edged, fine-toothed, and made from bone. Richardson and Wilson (1976: 178) refer to this type of comb as a "delicing comb of bone, exactly like the plastic ones of today..." Similar combs were found at 18th century Fort Michilimackinac in Michigan (Stone 1974: 141, Figure 72) and indicate that this type of comb has a long chronology. Other grooming aids include a two-pronged, vulcanite hair pin from the refuse zone outside Sand Springs station, suggesting the presence of women; a small mirror fragment from Cold Springs; and several ironstone-whiteware shaving mugs: a smooth, ring-based mug and 16 fragments of 8-sided mug from Sand Springs and a single smooth, ring-based mug from Cold Springs.

There is also archaeological evidence of personal adornment. Six beads were recovered at Sand Springs, five of which are glass and one vulcanite. The glass beads have been classified according to the system devised by Kidd and Kidd (1970). All are tube beads in that they have been cut from long glass tubes; however, four of the five have been further rounded by reheating after cutting. The single cut specimen, from Room 2, is blue monochrome with ground facets on the surface and, therefore, falls into the Kidd's Type 1f. It is 1/4 inch long, 1/4 inch outside diameter, and 5/32 inch bore diameter. Two other monochrome beads are in the collection, one from Room 2 and the other from Room 6; however,

the two oyster white beads have been rounded by reheating and fall into the Kidd's Type 11a. Both are 1/4 inch in outside diameter, approximately 1/4 inch long, and have bore diameters of 3/32 to 1/8 inch (the bore is oval-shaped). The same dimensions are common to two bichrome beads that have also been rounded by reheating. Different colors in tube beads are manufactured by dipping the glass blowing rod first into one color glass and then into another, resulting in a layered glass bubble that is then stretched out into a tube. The Kidd's classify this kind of bead as Type 1Va. One of the beads, from outside, has a red outside layer and a black center; the other bead, from Room 6, is pink on the outside and black/gray in the center. The sixth bead in the collection is not glass but vulcanite; it may not be a bead at all. It is black with two parallel fine white lines engraved into the outside surface, 9/32 inch in outside diameter, and has a 5/32 inch bore diameter. The length could not be measured because the bead is broken.

The only artifact used for personal adornment at Cold Springs is an opaque white glass bead from the excavated deposits in 13A, in the refuse zone just outside the building. The bead is cylindrical (tubular) and measures 7/32 inches long by 7/32 inches in diameter. A 1/8 inch diameter hole is drilled through the center.

Several clay tobacco pipes were recovered at Sand Springs, but none at Cold Springs; they can be grouped into two categories -

stemmed and unstemmed. All of the stemmed pipes that could be identified are of the "Dublin" type (Wilson 1961). Moore (1973: 75-76) describes it as

a pipe with a slightly curved stem of greatly varying length, with the bowl side nearest the smoker straight, or nearly so, the rim sloped upward toward the front, and the front side curved. The bowl itself was narrow and deep and often had a spur on the under side where the bowl and stem met.

Three Dublin bowl fragments in the Sand Springs collection, two from Room 2 and one from outside, fit this description exactly and have 18 grooves or "flutes" extending from the end of the stem nearest the bowl to the bowl itself. A third bowl fragment, from Room 2, shows fluting at the bottom but is smooth elsewhere. Two stem sections of this type have a 3/32 inch diameter bore, all from outside the building.

The "unstemmed" pipes have a short stem into which a reed is inserted and are more numerous and diverse than the stemmed types. All of the unstemmed pipes are made from colored clays and can be grouped into glazed and unglazed types. The glazed pipes have a dark brown exterior glaze, a "pimpled" surface, bowls at right angles to stems, and a spur on the underside of the bowl. At the end of the stem, the bore diameter is 9/32 inch, but it constricts to about 1/8 inch as it approaches the bowl. Most of the examples came from outside, but single fragments came

from Room 3, Room 5, and Room 2.

The unglazed, unstemmed pipes have been classified into two types. One type is represented by a single broken stem from outside the building. It is made from a reddish-orange clay, is undecorated, has a flaring end, and has a bore diameter of  $12/32$  inch at the end; however, it constricts to  $5/32$  inch near the bowl. The other unglazed type is colored black and has a bowl formed like a human head. Its stem is straight rather than flaring but has a rim on the end. The bore diameter ranges from  $13/32$  inch at the end to  $5/32$  inch at the bowl. Not enough of the head is present for accurate description but ears, eyes, and eyebrows are in relief and a stippled headband is present around the rim of the bowl. In addition there are flutes on the underside of the bowl at the intersection with the stem, the exact number of which could not be counted because the pipe is broken here. All four examples came from Room 3; however, a variant of this type was collected in Room 2, represented by a single fragment of the bowl rim. The bowl is in the form of a human head but no stippled headband is present; furthermore, there is a light olive brown glaze on the inside of the bowl.

The two remaining pipes, both from outside, are too fragmented to classify. One is white clay and probably comes from a bowl, the other is salmon colored clay and is also probably part of a bowl.

Another important difference in the human behavior of the

Sand Springs and Cold Springs occupants is in the use of patent medicines. No medicine bottles could be identified in the Cold Springs collection, but several kinds were recovered from Sand Springs. One fragment from outside the building has a side panel embossed with the words "F. Brown's Ess of Jamaica Ginger, Philada." The company manufacturing this patent medicine was in business from the 1850s to the turn of the century, but the absence of a pontil on our specimen suggests that it was made after 1860. Twenty-one other fragments of medicine bottles were recovered at Sand Springs. Seventeen are Catawba Wine Bitters, all from Room 3 and probably from the same bottle. Catawba Wine Bitters was made from 1860-1866 and was distributed on the west coast. Two (2) fragments of Merchant's Gargling Oil liniment, Lockport, New York were found in Room 5. The company was in business from about 1840 to the turn of the century but the Sand Springs examples probably date to the early 1860s. Two (2) fragments from outside the building, probably from a single bottle, are from a Davis Vegetable Pain Killer bottle. The brand was manufactured from the late 1850s to the turn of the century; it is impossible to more precisely date this specimen.

The firm of Russell, Majors, and Waddell was adamantly opposed to the use of alcohol beverages by its employees and required them to sign an oath saying that they would not indulge. But observations of drunken pony express riders falling off their

horses (e.g., Cody 1879) suggests that the oath was not too effective. The archaeological record of Cold Springs and Sand Springs stations supports that conclusion: Wine or champagne bottles are most abundant at both sites, 8 fragments coming from Cold Springs and 28 from Sand Springs. Of the latter, 15 are from a "black glass" demijohn container found just outside the station walls. Five fragments of London Jockey Clubhouse gin bottles were located at Sand Springs. This kind of container was manufactured from the late 1850s to the 1870s, and the early varieties have an improved pontil; however, none of our examples is a base. Finally, 3 fragments of ale or brandy bottles were recovered from Cold Springs and one from Sand Springs, and a single amber beer or whiskey bottle fragments came from Cold Springs. The bottles that could be identified make up only a small part of the collection. At Sand Springs alone, there are an additional 853 bottle fragments that could not be definitely assigned to a particular use category, but are probably liquor, condiment, and medicine bottles; 309 unidentified bottle fragments were also recovered from Cold Springs station. Table 4 earlier in this report tabulates the unidentified bottle fragments by color and the associated discussion suggests the most likely use of bottles of the most common colors.

The only other personal artifact in the two collections is a Chinese coin with a square center-hole found just outside the walls of Sand Springs station. Although the side giving the

denomination is too corroded to read, the characters on the other side indicate that it was a coin of the Ch'ien Ling dynasty, dating from 1736-1796.

#### COMMUNICATIONS

Sir Richard Burton was quite emphatic about the inability of the attendants at Cold Springs to read or write (1862: 487); yet one would expect such skills to be useful in the pony express operation. The archaeological record of both stations supports that conclusion. Two crowquill pen points, one badly twisted, were found at Cold Springs; in addition one nearly complete base of an aqua "umbrella" ink bottle and three base fragments were recovered from the same site. The base had an open pontil. Umbrella ink bottles pre-date 1860 but were often reused, being refilled from "master" ink bottles. The cultural deposits at Sand Springs yielded 3 pieces of graphite lead, as well as 2 lead stamps or seals. Both of the seals have raised letters or numbers on the stamping end that are too badly corroded to read. The stamps were used to make an impression in wax, in much the same way that letter seals are made today.

The documentary record of Sand Springs gives evidence that the building was used as a telegraph station as well as a stage and pony express station, probably from the end of July 1861 until the line was discontinued. An 1868 survey of Township 17N Range 32E, Section 31, on Fourmile Flat just west of the site, shows a telegraph line running on a course that would intercept Sand

Springs station. The remnants of the line can still be seen today, although it was removed from the sand dunes in the immediate vicinity of the building during the early part of this century (Mark Lattin, Robert Barkley, personal communication) Archaeological evidence from Sand Springs also suggests that it was used for telegraphing. Two vulcanite fragments from Room 3 are part of a flange on a Goodyear's "peg type" telegraph insulator popular during the 1850s. A third hard rubber artifact from Room 1 is probably also part of peg type insulator. In addition, several pieces of braided copper wire from Room 3 are from some kind of electrical equipment and most probably are from the resister of a telegraph key.

#### WEAPONS

Both Cold Springs and Sand Springs were thrown into the midst of the Paiute War and were otherwise threatened with hostile action; therefore, it is not surprising to find evidence of firearms and other weapons in their refuse. Percussion caps, slugs, gunflints, ramrods, and lithic projectile points are included.

Five percussion caps from cap-lock rifles were recovered from Cold Springs and 28 caps from rifles and pistols were found at Sand Springs, both detonated and undetonated. Although never very common in the frontier west, cap-lock weapons were used in place of flintlocks in a number of trading posts and military forts during the 1830s and 1840s and somewhat later. According to Russell ( 1957: 243):

The (percussion) cap itself is made of thin-gauge copper. It is slightly conical with a flaring rim around the open end. Four slits extend halfway from the rim toward the dome of the cap, assuring ready and secure adjustment of the cap upon the nipple of the gun. The powder with which the caps are charged usually consists of fulminate of mercury mixed with half its weight of saltpeter. Half a grain of this percussion powder constitutes the charge, which is compressed into the cap and made waterproof and airtight by a drop of varnish. In military service the caps were distributed in bags of strong linen, 10,000 in a bag.

Except for the percussion cap, the cap-lock gun was mechanically like the flint-lock. That the older flint-lock weapons were used upon occasion in pony express stations is, however, verified by the discovery of a gunflint at Cold Springs. The gunflint is prismatic and wedge-shaped, tapering from the back (the side clamped in the gun cock) to the edge (the side that strikes the frissen). It measures .719 inches long (back to edge), .969 inches wide, .500 inches thick at the back, and .281 inches thick at the edge; it is made from a black obsidian.

Minie' balls, conical balls, and solid round balls were discovered, the vast majority at Sand Springs, along with a slug and a sheared ring of lead from a .38 caliber percussion revolver and rim and body fragments from brass cartridge casings. These

slugs suggest the use of percussion, cartridge, and possibly flint-lock rifles, smoothbore muskets, and percussion revolvers. Five(5) minie' balls were recovered at Sand Springs, 4 of which are .56 caliber(one is fragmented and the caliber has been estimated) and one of which is .65 caliber. The four .56 caliber balls are rifled with 3 grooves while the single .65 caliber ball is unrifled. According to Garavaglia and Worman(1977), the main military minie' ball sizes were .54, .58, and .65 caliber.

Unlike the minie' ball, the conical or picket ball has a solid base and was forced into the muzzle without using a patch or other protective cover to assure a tight seal between the bullet and the barrel. Of 4 conical balls from Sand Springs, 2 are .44 caliber with 3 groove rifling, usually a popular size because it could be used in either a rifle or revolver, and 2 are smooth: one is .31 caliber and the other is .38 caliber.

The most common bullet at Sand Springs is a solid round ball that was usually "patched" and forced into the muzzle. In long guns, the diameter of the ball is slightly less than the diameter of the bore to allow for the patching. Balls of this kind were used in smooth-bore muskets, patched or roundball rifles, and revolvers. Eleven(11) are in the Sand Springs collection, evenly divided between .31 caliber(5 examples) and .38 caliber (5 examples) sizes. The remaining ball is a Number 1 bird-shot(.16 inch in diameter). A single .344 caliber ball was

found at Cold Springs. A ring of lead from Sand Springs appeared to have been sheared from a ball into a .38 caliber. According to Nonte (1974:25-26), this treatment is typical of a muzzle loading percussion revolver. In such firearms

the round ball is not patched and is deliberately cast several thousandths of an inch larger than the chamber in which it is to be used. It is thus intended that the chamber mouth will shear off a ring of lead around its periphery, reducing its diameter as the ball is seated, and that a tight and hopefully flameproof seal will be had to prevent the flash from one chamber igniting the next to it, possible producing a multiple discharge. Actually, this shearing action converts the lead sphere to a very short cylindrical bullet with a hemispherical nose and base. (Nonte 1974:25-26)

A T-shaped metal artifact from outside Sand Springs is tentatively identified as the handle of a ramrod for muzzleloading weapons.

There is also archaeological evidence of bow-and arrow technology, but only that from Cold Springs is probably late enough to suggest the Paiute war. Three (3) lithic projectile points were recovered from Room 2 at Sand Springs. One is the broken tip of a dark gray obsidian point. The other two points are complete and are manufactured from a striped red to salmon colored chert. One is a Humboldt Concave Base A point with the following dimensions: maximum length - 41.6 mm; maximum width - 18.0 mm; thickness - 6.9 mm; weight - 4.8 grams. This type of point usually predates 500 A.D. The other point is an Eastgate Expanding Stem with

dimensions as follows: maximum length - 43.2 mm; maximum width - 21.5 mm; thickness - 3.9 mm; weight - 2.4 grams. Eastgate points date from 500 A.D. to 1300 A.D.

At Cold Springs station, one small fragment of a lithic projectile point base was recovered from stratum 6 of Room 1, associated with two spent unidentified bullet slugs. The only measurement possible is width: .938 inches. No type determination is possible. The projectile is manufactured from a red and white striped chert and is unifacially chipped. A second lithic projectile point base came from the surface outside the station. One side is corner notched, but the other is broken so that neither type determination nor measurements are possible. The broken end opposite the base appears to have been reworked into a steep bevel, but it is possible that the appearance of reworking is accidental. A cream/red mottled chert was the material used to manufacture the projectile.

#### LIVERY ACTIVITIES

Livery activities are expected in a pony express station, and there is archaeological evidence of just that at both sites. Twenty-nine (29) artifacts from Sand Springs were used in livery activities. Most of these are iron shoes for mules, horses, and oxen.

The 3 ox shoes are about the same size but there is considerable variation in the size of mule and horse shoes. Relatively small animals are suggested, not the size that would be suitable for large freighting wagons; however, there are two exceptions, one a mule and the other a horse. Nearly all of the iron shoes were

recovered from Rooms 3, 4, and 5. The other livery artifacts are harness gear or wagon hardware, most of which came from Room 3. One nearly complete front undercarriage of a wagon came from the top stratum of room 5, about 12 inches above the living floor, and suggests that the station was reused temporarily after the express occupation; that is the 1908 prospectors occupation.

Five artifacts from Cold Springs are associated with the farrier's trade. Two are complete horseshoes from Room 3, and a horseshoe fragment was also recovered from Room 1. Finally, two metal fragments are identified as the "ends" cut from horseshoes during their preparation.

#### ARCHITECTURE AND CONSTRUCTION

Archaeological evidence of construction and related activities exists at both sites, in addition to the standing remains of the buildings. Because its metal is much better preserved, Cold Springs has by far the best architectural evidence, including a wide variety of nails, tacks, screws, wooden pegs, and the like; however, the 3 wooden floor joists at Sand Springs, already discussed, and 53 pieces of window glass are suggestive of the building's method of construction. Five badly corroded, and unidentifiable nails, were recovered from Sand Springs, but 263 nails were found at Cold Springs, reflecting the much better preservation and not a difference in architecture. The nails have been classified by method of manufacture, shape, and size, in decreasing order of importance, as listed in Table 8.

The remaining architectural artifacts are rare, including a whittled wooden peg, 4 inches long and 9/16 inch in diameter, driven into the wall of Room 3 at Cold Springs, and a small whittled wooden wedge, 4 inches long by 3 inches wide by 2.5 inches thick, found outside the walls of the same building. In addition, a small iron door knob and an iron handle, 7.75 inches long, are from Cold Springs, and a badly corroded iron artifact from Sand Springs may be a door knob.

#### THE PONY EXPRESS STATION PATTERN

South (1977) shows the value of using numerical studies of artifact categories from historic sites to define differences and similarities in patterns of human behavior. Thus, he is able to use differences in the ratio of wine bottles, ceramics, and nails to distinguish a "Carolina" and a "Frontier" pattern in 18th century South Carolina and North Carolina. Here we are interested in whether or not a "pony express station" can be defined and used for purposes of site identification; that is, are there proportions or ratios of categories of artifacts found in pony express stations that are distinctively different from artifact categories in contemporary 19th century sites used for other purposes?

Cumulative percentage curves, or ogives, are useful for comparing the overall similarity of artifact collections from different sites (v. Johnson 1968: 22ff). An Ogive is constructed by calculating the percentage of the total collection contributed by each artifact category, plotting the percentage of the first category on a graph,

adding that percentage to the percentage of the second artifact category and plotting that value, and so on until all categories have been plotted. The final value must be 100 percent. If the ogives of two collections are similar, the percentages of each artifact category are similar; if, on the other hand, the ogives are different, the artifact collections are made up of different artifact proportions. For our purposes, a pony express station pattern is defined if artifacts from those sites have significantly different ogives than the artifacts from other 19th century sites in central Nevada.

Figure 18 gives the ogives for Sand Springs and Cold Springs, in addition to 3 sites at nearby Rock Creek stage and telegraph station (Hardesty 1978a) and the guardhouse at nearby Fort Churchill (Hardesty 1978b). They are different in at least one important way. All of the Rock Creek sites and the Fort Churchill building have a pattern dominated by a high percentage of bottles and a low percentage of bone. By contrast, the two pony express stations have ogives distinguished by a low percentage of bottles and a high percentage of bone. Why? The most obvious explanation is that bone refuse was allowed to accumulate in and around the pony express stations, but not the others. In fact, if bone is removed from the Sand Springs and Cold Springs collections, the ogives are very similar to the Rock Creek sites.

The principal difference between the two sets of artifact patterns is, then bone refuse disposal - one probably using a dump

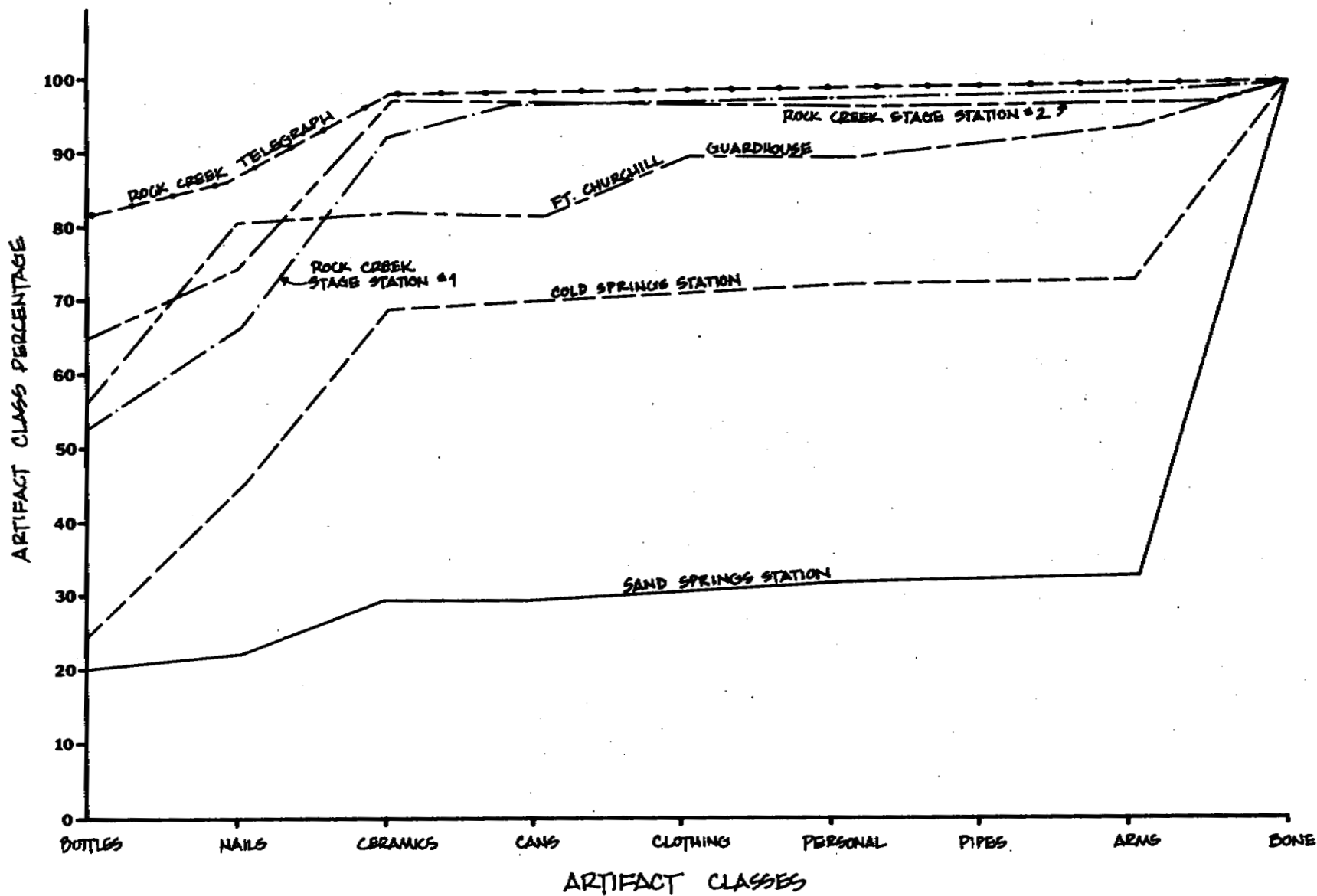


Figure 18. Artifact Patterns from Cold Springs and Sand Springs Stations  
Illustrated with Cumulative Frequency Curves (From Hardesty 1978a, Figure 15)

away from the main buildings and the other throwing refuse out the window. And that difference is the only way that the pony express, stage, and telegraph stations can be separated, suggesting that the activities taking place in each were very much alike. The guardhouse at Fort Churchill is more distinctive, however; ceramics, the main archaeological evidence of household activities, are virtually absent and clothing makes up a relatively large percentage of the total artifacts. What else could be expected! That contrast sets the stage for the definition of a pony express/stage/telegraph station pattern, on the one hand, and a military fort guardhouse pattern, on the other. The next step is to see whether the pony express/stage/telegraph station pattern can be distinguished from the archaeological remains of ranch or farm houses, prospector's cabins, and the like. Unfortunately, no comparative data exist at the present time.

#### THE SPATIAL ORGANIZATION OF BEHAVIOR

The architectural layout and depositional variability of the two pony express stations suggest that space was important in the arrangement of human activities. Documents lend some support to this idea. Sir Richard Burton observed, for example, the following spatial arrangement of material culture at Butte station (Burton 1862:469).

1. rail corral behind the house, with a shed in one corner.
2. refuse disposal zone just outside the door.
3. house divided by a canvas partition into a sleeping-

storage area and a cooking/eating and general purpose area.

4. storage of "...saddles, cloths, harness, and straps, sacks of wheat, oats, meal, and potatoes" (ibid., p. 469) was under the bunk beds in the sleeping area.
5. "the walls were pegged to support spurs and pistols, whips, gloves and leggings" (ibid., p. 469).
6. A large fireplace built into the north wall was the focal point for food preparation and consumption activities. One of two tables was "placed as buffet in the corner near the fire with eating apparatus - tin coffee pot gamelles, rough knives, 'pitchforks,' and pewter spoons" (ibid., p. 469). The other table was placed near the center of the general purpose area and was used for dining.
7. on a low wooden shelf next to the doorway was a "tin skillet and its 'dipper'" (ibid., p. 469) for washing, and possibly drinking, purposes.

The spatial organization of this small, one room station was probably rather typical of pony express stations in the Great Basin; unfortunately, we have no information about the arrangement of activities in larger, multi-room stations such as Cold Springs and Sand Springs. That is the purpose of this chapter.

#### THE RECOGNITION OF ACTIVITIES THROUGH THE ARCHAEOLOGICAL RECORD

The key to understanding human behavior through the archaeological record is not just the identification of artifacts and other products of human activity; it is the recognition of relation-

ships among artifact categories (South 1977). In other words, the identification of artifact patterns is the key to human behavior. Pattern recognition can be done through several archaeological methods, including the analysis of spatial variability in artifact ratios and percentages, artifact diversity, the intensity of deposition, and soil chemistry.

#### Artifact Ratios and Percentages

A fundamental clue to the kinds of activities that took place from one room to another is the relative occurrence of different artifact categories. A room having 90 percent slag, firebrick, horseshoes, and metal fragments, and only 10 percent ceramic containers, glass bottles, utensils, and bone remains is likely to have been used for a different purpose than a room with these percentages reversed. Tables 10 and 11 show the relative percentages of the major artifact categories recovered from Sand Springs and Cold Springs stations. A useful way of graphically illustrating the patterns that the percentages represent is with cumulative percentage curves or ogives (Johnson 1968: 25ff), as previously discussed, and figures 19 and 20 show ogives constructed for each of the rooms in the two pony express stations. Those rooms that have been used for the same, or different, activities are easily observable. Another way of recognizing artifact patterns is through the use of artifact ratios. That method is suggested by South (1977: 171-172) and is simply the

TABLE 10 SPATIAL DISTRIBUTION OF ARTIFACT CLASSES AND PERCENTAGES

## AT SAND SPRINGS STATION

Artifact Class	Room 1		Room 2		Room 3		Room 4		Room 5		Room 6	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Bottles	14	6.1	234	21.8	83	12.9	33	6.2	50	9.1	10	3.3
Architectural	23	10.1	21	2.0	1	0.2	1	0.2	5	0.9	2	0.7
Household	0	0.0	80	7.5	205	31.8	3	0.6	65	11.9	0	0.0
Clothing	3	1.3	21	2.0	5	0.8	6	1.2	6	1.1	11	3.6
Personal	3	1.3	12	1.1	11	1.7	0	0.0	2	0.4	3	1.0
Arms	11	4.8	12	1.1	8	1.2	2	0.4	0	0.0	12	4.0
Bone	174	76.3	684	63.9	326	50.5	484	91.3	419	76.5	256	85.0

TABLE 11. SPATIAL DISTRIBUTION OF ARTIFACT CLASSES AND PERCENTAGES  
AT COLD SPRINGS STATION

Artifact Class	Room 1		Room 2		Room 3		Room 4	
	No.	%	No.	%	No.	%	No.	%
Bottles	40	11.6	173	21.8	57	71.2	9	75.0
Architectural	65	18.9	160	20.2	11	13.8	0	0.0
Household	8	2.3	326	41.2	0	0.0	0	0.0
Clothing	6	1.7	7	0.9	0	0.0	0	0.0
Personal	3	0.9	4	0.5	1	1.2	0	0.0
Arms	7	2.0	5	0.6	1	1.2	0	0.0
Livery	2	0.6	1	0.1	2	2.5	0	0.0
Bone	212	61.6	112	14.1	5	6.2	0	0.0

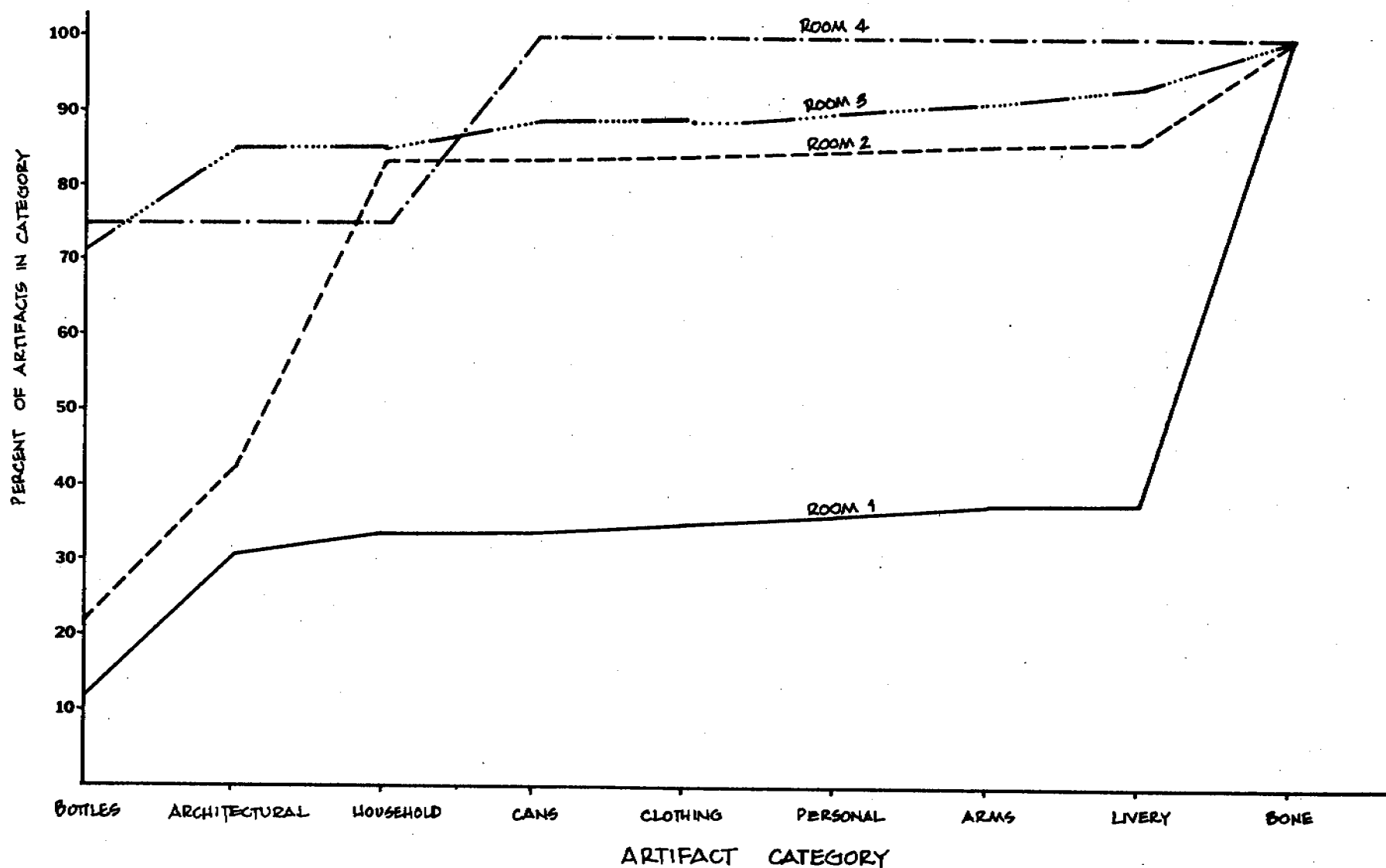


Figure 19. Room Artifact Patterns at Cold Spring Station Illustrated with Cumulative Frequency Curves

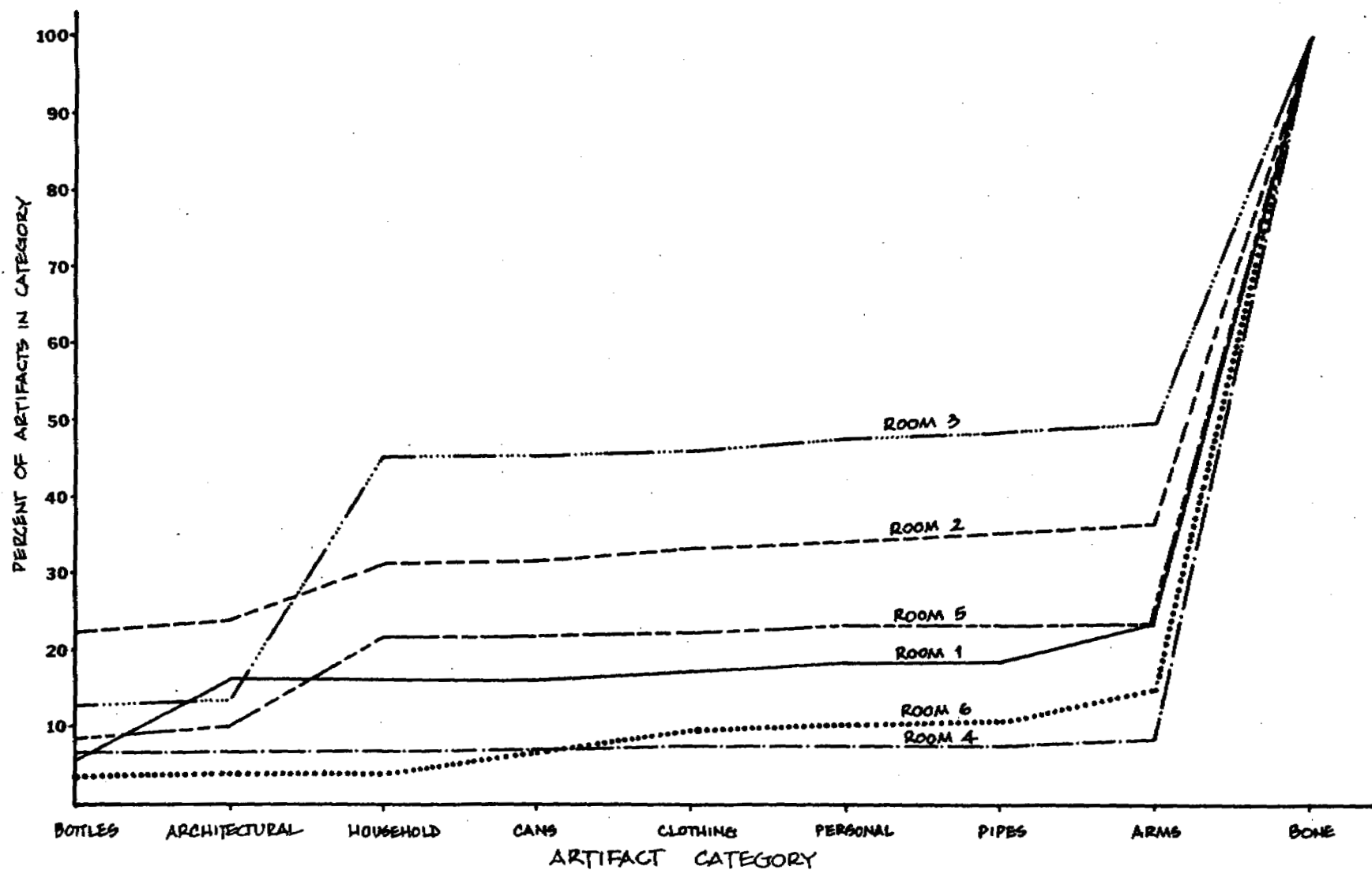


Figure 20. Room Artifact Patterns at Sand Springs Station Illustrated with Cumulative Frequency Curves

index obtained by dividing the number of artifacts in a given category (e.g., bottles, weapons, bone) by the number of artifacts in all other artifact categories in the collection. Ratios give a clear look at those artifact categories that dominate a collection or are rare and are useful for comparative purposes. Tables 12 and 13 give the ratios calculated for different rooms at Cold Springs and Sand Springs. The implications of these percentages, ogives, and ratios for activity patterns at the two stations will be discussed at the end of this chapter.

#### Artifact Diversity

Another component of spatial variation in human behavior is its complexity. For archaeological purposes complexity can be viewed as the diversity of activities involved. A simple measure of activity diversity is the number of different artifact categories present in the archaeological record of each spatial unit. Tables 14 and 15 give this information for Cold Springs and Sand Springs stations.

#### Intensity of Deposition

The third way of studying spatial patterns is through the intensity with which artifacts are deposited in the archaeological record. Variability in intensity can be caused by a number of things, including differences in the kind of activities taking place or the intensity of activities during a given time period; differences in the rate at which artifacts are discarded, lost,

TABLE 12. SPATIAL DISTRIBUTION OF ARTIFACT RATIOS  
AT SAND SPRINGS STATION

<u>Artifact Class</u>	<u>Room 1</u>	<u>Room 2</u>	<u>Room 3</u>	<u>Room 4</u>	<u>Room 5</u>	<u>Room 6</u>	<u>Outside</u>
Bottles	.311	1.251	.293	1.269	.556	.227	3.923
Ceramics	0	.217	1.273	.054	.867	0	.034
Buttons	.035	.029	.014	.073	.037	.227	.010
Adornment	.017	.029	.025	0	.007	.038	.026
Arms	.229	.029	.022	.035	0	.286	.014
Livery	0	.022	.028	.157	.029	.019	.007
Bone	2.949	1.625	.891	3.203	2.993	4.741	1.176

TABLE 13. SPATIAL DISTRIBUTION OF ARTIFACT RATIOS  
AT COLD SPRINGS STATION

<u>Artifact Class</u>	<u>Room 1</u>	<u>Room 2</u>	<u>Room 3</u>	<u>Room 4</u>	<u>Outside</u>
Bottles	.435	.341	3.167	3.000	.122
Ceramics	.011	.509	0	0	.043
Buttons	.048	.010	0	0	0
Adornment	.023	.006	.014	0	.007
Arms	.056	.007	.014	0	0
Livery	.015	.002	.027	0	0
Nails	.760	.308	.172	0	.312
Bone	1.607	.165	.067	0	0

TABLE 14. OCCURRENCE OF ARTIFACT CATEGORIES AT SAND SPRINGS

Artifact Category	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Outside
Liquor Bottles		X	X	X	X		X
Condiment Bottles		X	X	X			X
Medicine Bottles		X	X		X		X
Whiteware/ironstone plates		X		X	X		
Whiteware/ironstone saucers		X			X		
Whiteware/ironstone bowls		X			X		
Cut glass bowls		X					
Drinking glasses					X		X
Buckets				X			
Sardine cans							X
Utensils		X					X
Buttons	X	X	X	X	X	X	X
Straight pins	X	X					
shoes		X		X	X	X	X
Beads	X	X			X	X	X
Combs, hair		X	X			X	X
Pins, hair							X
Pipes, tobacco		X	X		X		X
Writing implements	X		X		X	X	
Slugs	X	X	X	X		X	X
Percussion caps	X	X	X	X		X	X
Ramrods							X
Cartridge casings		X	X				
Projectile points, lithic		X					
Nails			X	X	X		X
Bolts and nuts		X	X	X		X	X
Rivets, copper		X					X
Animal shoes			X	X	X	X	X
Tack		X	X				X
Wagon hardware			X		X		
Metates, manos			X			X	
Coins							
Telegraph insulators	X		X				
Whetstones					X		
Brass lid, cooking pot	X						
Iron chain links		X	X				
Copper wire fragments		X	X				
Iron Stove door					X		

<u>Artifact Category</u>	<u>Room 1</u>	<u>Room 2</u>	<u>Room 3</u>	<u>Room 4</u>	<u>Room 5</u>	<u>Room 6</u>	<u>Outside</u>
Textiles						X	X
Lead fragments		X	X			X	X
Metal foil fragments		X	X				X
Crockery							
TOTAL DIVERSITY	<u>8</u>	<u>24</u>	<u>22</u>	<u>11</u>	<u>16</u>	<u>12</u>	<u>23</u>

TABLE 15. OCCURRENCE OF ARTIFACT CATEGORIES AT COLD SPRINGS

Artifact Category	Room <u>1</u>	Room <u>2</u>	Room <u>3</u>	Room <u>4</u>	Outside
Liquor bottles	X	X			X
Condiment bottles	X	X			X
Ink bottles	X				
Tobacco cans			X	X	X
Buckets				X	X
Barrel hoops	X				X
Pots, cast iron		X			
Whiteware/ironstone plates		X			
Whiteware/ironstone bowls		X			
Utensils		X			
Nails	X	X	X		X
Tacks, screws	X				
Door hardware	X				
Buttons	X	X			X
Belts	X	X			
Shoes	X				X
Combs, hair	X	X			
Combs, lice	X				
Beads					X
Pen points (writing)		X			
Slugs	X	X			
Percussion caps	X	X			
Gun flints		X			
Projectile points, lithic	X				X
Animal shoes	X	X	X		
Wooden pegs			X		
Flakes, lithic	X		X		X
Cans, unidentified	X	X	X	X	X
Poles, metal				X	
Mirrors					X
Crockery		X			
Whiteware/ironstone unidentified	X	X			X
Glass, unidentified	X	X	X	X	X
Metal, unidentified	X	X	X		X
Leather, unidentified		X	X		X
TOTAL DIVERSITY	21	21	9	5	17

or abandoned by the same activities; time differences; differences in post-depositional disturbances; and the like (v. Schiffer 1976). What we are interested in, however, at this point is not what caused variation in the intensity of deposition but whether or not differences exist from one place to another within the site. The intensity of deposition is measured by the number of artifacts per unit volume of deposit. Tables 16 and 17 list these data for the two pony express stations.

#### Soil Chemistry

Variation in the chemistry of archaeological deposits has been shown to be a useful clue to past human activities and, for this reason, 27 soil samples from Sand Springs and 60 soil samples from Cold Springs were collected and chemically analyzed. The Division of Plant, Soil and Water Science at the University of Nevada, Reno, did the analysis, under the direction of Mrs. Diana Thran, Research Soil and Water Scientist. Ten tests were run, including pH, percent organic carbon, total phosphorus, milli-equivalents (me)/100 grams exchangeable calcium, me/100 grams exchangeable potassium. In addition, the percent coarse fragments was determined.

Table 18 gives the chemical values of 27 soil samples taken from the "living zone" and its immediate vicinity at Sand Springs station. Samples taken from the same lot have been averaged. Exchangeable cations are not significantly different from one room to another and, therefore, are not useful in the recognition

TABLE 16. INTENSITY OF DEPOSITION AT SAND SPRINGS

	<u>Room</u> <u>1</u>	<u>Room</u> <u>2</u>	<u>Room</u> <u>3</u>	<u>Room</u> <u>4</u>	<u>Room</u> <u>5</u>	<u>Room</u> <u>6</u>	<u>Outside</u>
Excavated Area(cubic meters)	1.6	2.8	4.2	.35	1.6	1.75	18.8
Artifacts	59	421	366	59	140	54	704
Bone	174	684	326	484	419	256	828
Total Refuse	230	1105	692	543	559	310	1532
Density (refuse/m <sup>3</sup> )	143.8	394.6	164.8	1551.4	349.4	177.1	81.5

TABLE 17. INTENSITY OF DEPOSITION AT COLD SPRINGS

	Room <u>1</u>	Room <u>2</u>	Room <u>3</u>	Room <u>4</u>	Outside <u>        </u>
Excavated Area(cubic meters	1.96	5.4	1.84	0	.8
Artifacts	515	854	108	15	135
Bone	212	112	5	0	12
Total Refuse	727	966	113	15	147
Density(refuse/m <sup>3</sup> )	370.9	178.9	61.4	--	183.8

TABLE 18

Soil Chemical Analysis: Averages for Spatial and/or  
Stratigraphic Units at Sand Springs

Room	Unit		Exchangeable Cations in Milliequivalents per 100 grams of Soil									
	Stratum	PPM NO <sub>3</sub> -N	PPM Total Phosphorus	Calcium	Magnesium	Sodium	Potassium	% Coarse Fragments	pH	% Organic Carbon	% Organic Nitrogen	Ortho Phosphate
1D	4	6.57	703	13.4	0.844	11.15	2.86	1.5	<u>9.3</u>	0.173	0.0	4.9
2D	3	33.95	834	17.46	1.14	4.32	1.59	1.4	8.5	0.635	0.015	11.6
2D	4	15.92	577	13.30	0.66	3.05	0.93	2.0	8.6	0.278	0.0	12.5
2G	3	100.10	691.5	15.34	1.04	3.38	1.06	1.3	8.2	0.635	0.04	46.0
2M	3	<u>100.0</u>	802	11.72	1.01	3.39	0.96	< 1	8.2	0.519	0.015	35.0
2N	3	45.37	1123	21.30	1.77	4.32	1.26	1.4	<u>9.1</u>	0.666	0.0	89.3
3A	3	60.44	<u>1095.5</u>	14.02	1.96	10.6	3.05	1.7	8.7	1.424	.02	27.8
3A	4	23.36	398	11.16	0.636	1.79	0.62	< 1	9.2	0.0	0.0	4.40
3F	3	9.67	586	12.61	0.673	3.93	0.65	< 1	8.8	0.578	0.02	12.5
3F	3	10.03	<u>954</u>	19.43	1.447	6.85	0.45	3.6	8.0	2.43	0.045	13.7
3F	3	85.42	<u>2453</u>	18.58	2.34	5.47	0.37	3.2	8.2	2.08	0.045	<u>165</u>
3F	3	4.53	754	10.75	0.589	3.52	0.60	< 1	8.2	0.611	0.015	29.98
3G	3	13.05	692	12.22	0.556	2.46	0.75	< 1	8.6	0.260	0.015	17.9

Exchangeable Cations in  
Milliequivalents per 100 grams of Soil

Room	Unit Stratum	PPM NO <sub>3</sub> -N	PPM Total Phosphorus	Calcium	Magnesium	Sodium	Potassium	% Coarse Fragments	pH	% Organic Carbon	% Organic Nitrogen	Ortho Phosphate
Outside	3	85.45	394	8.26	0.12	0.51	0.16	< 1	8.2	0.167	0.0	6.25
5B	2	4.53	<u>3803</u>	21.12	7.31	3.77	5.75	1.1	6.0	7.57	0.47	<u>250</u>
5R	2	<u>226</u>	<u>2512</u>	13.77	2.79	2.74	1.10	< 1	7.7	1.96	0.11	<u>581</u>
5K	2	5.58	<u>9933</u>	17.81	12.2	13.01	6.20	< 1	6.5	9.99	0.82	<u>750</u>
5K	3	<u>129.6</u>	<u>965</u>	9.56	1.37	1.20	1.82	< 1	7.9	0.332	0.15	<u>202.6</u>
6A	2	49.47	651	10.13	0.59	4.43	3.27	< 1	<u>9.3</u>	0.195	0.0	15.0

of distinct human activities. The remaining chemical characteristics, however, are most useful. pH values are very high in Rooms 1 and 6, probably originating in the mud chinking that has fallen from the walls. Both of these rooms are unusual in having heavily chinked interior walls. By contrast, pH values in Room 5 are quite low and reach into the acid range. Low pH is characteristic of soils with a high organic content, and the "layered" texture and color of the deposits in this room suggest that the organic material is manure. High total phosphorus and orthophosphate values in Room 5 also indicate an organic soil. A high percentage of organic carbon is the final chemical component of the organic soil pattern. Rooms 2 and 3 have deposits that are highly variable in organic content, if total phosphorus, orthophosphate, and organic carbon values are reliable indicators. This kind of soil chemistry is consistent with the archaeological record, which suggests that the rooms were used for a variety of activities, including refuse disposal.

The chemical values of the 60 soil samples taken at Cold Springs station are listed in Table 19. pH tests were not run, and samples taken from the same lot have been averaged. Chemical patterns at the two sites are essentially identical; however, the actual values are quite different for several elements. Thus, exchangeable calcium and sodium values are much higher at Sand Springs, while total phosphorus values are considerable higher at Cold Springs. These differences are likely due to different

TABLE 19

## SOIL CHEMICAL ANALYSIS: AVERAGES FOR SPATIAL AND/OR STRATIGRAPHIC UNITS AT COLD SPRINGS

Unit Room      Stratum	% Coarse Fragments	% Organic Nitrogen	PPM NO <sub>3</sub>	PPM Ortho- Phosphate	% Organic Carbon	Total Phosphorus	Exchange- able Calcium	Exchange- able Magnesium	Exchange- able Sodium	Exchange- able Potassium
IC Surface	24.8	.06	3.52	25.9	1.58	3010.5	7.31	1.94	.147	4.1
IC Stratum 4	33.1	.07	2.29	50.9	1.22	3021.3	14.03	1.97	.163	3.3
IC Stratum 5	11.0	.03	2.54	41.4	0.51	4035.0	17.04	2.63	.104	5.6
2, Total Surface	26.8	.18	0.72	51.6	2.98	3460.7	10.35	2.21	.131	3.4
2, Surface, SW Quad	19.6	.21	12.17	61.9	3.62	3996.4	12.43	2.44	.151	3.5
2, Surface, SE Quad	31.5	.12	4.01	36.4	1.77	2870.6	8.46	1.97	.126	3.2
2, Surface, NE Quad	34.8	.21	15.26	51.0	3.29	3267.8	8.82	1.06	.106	3.5
2, Surface, NW Quad	27.9	.18	3.21	49.6	2.76	3179.5	9.84	1.91	.113	3.2
2D, Stratum 3	31.2	.13	6.26	58.4	1.92	3522.0	8.08	1.94	.332	3.5
2D, Stratum 4	38.2	.10	4.48	65.0	1.42	3984.5	7.42	1.80	.438	3.4
2B, Stratum 3	32.4	.14	6.15	40.7	2.42	3696.5	8.70	1.86	.086	2.8
2B, Stratum 5	21.9	.07	2.98	44.1	1.23	4589.0	10.47	2.32	.009	3.6
3, Total Surface	35.0	.17	64.86	112.9	2.56	4146.1	5.94	1.53	.112	2.6
3A, Surface	32.8	.24	145.8	149	3.67	4331	5.83	1.52	.16	2.96
3C, 3E, Surface	34.6	.14	6.29	120	1.70	4408	6.34	1.58	.06	2.56
3G, 3I, Surface	38.7	.10	1.96	52.2	1.76	3607	5.71	1.50	.08	2.06
3A, Stratum 4	27.7	.25	111.75	233.2	3.29	5579.6	7.72	1.53	.139	2.8
4, Total Surface	31.4	.24	5.71	52.4	3.48	3287.2	9.16	2.05	.160	2.3
4, Surface, SW Quad	32.6	.32	8.30	80.2	4.36	3615	9.10	2.22	.22	2.94
4, Surface, SE Quad	30.0	.29	3.70	42.9	4.52	3378	9.90	2.15	.126	2.20
4, Surface, NW Quad	27.0	.12	6.76	42.4	1.70	2650	7.42	1.72	.163	1.73
4, Surface, NE Quad	36.1	.22	4.08	44.1	3.40	3506	10.21	2.11	.140	2.33
Outside, surface	25.4	.16	5.36	202.0	2.10	6827	8.26	1.84	.131	3.2

soil types rather than different human activities. The "organic soil" pattern defined at Sand Springs shows up again at Cold Springs in Room 3, a room with archaeological evidence supporting its use as a stable. High total phosphorus and orthophosphate values are part of the pattern but, unlike Sand Springs, the percentage of organic carbon is not especially high. Room 2 is quite variable in chemical values, reflecting the wide range of activities that is suggested in the archaeological record. The remaining rooms, 1 and 4, are distinguished by relatively low values of total phosphorus and orthophosphate, along with a relatively high exchangeable calcium content in Room 1.

#### ACTIVITY PATTERNS AT COLD SPRINGS

The spatial arrangement of activities at Cold Springs station is similar in some ways to Butte station, but different in others. Artifact and soil chemistry patterns suggest rooms specialized for domestic activities, animal husbandry, and storage/maintenance. Refuse disposal took place just outside the room used for living quarters and just outside the stations walls. A more detailed description follows.

##### Room 1

Without a doubt, this, the southernmost room in the station and the only one with a fireplace, was the living quarters and the center of domestic activities. Supporting evidence includes:

1. Architectural features such as a fireplace, plastered walls, a roof, and gunports.

2. High ratio of faunal remains, especially cut and burned small fragments of bone.

3. High diversity of artifact categories, suggesting a wide variety of activities that might be expected in a living quarter.

4. Most of the artifacts used for grooming came from this room. Unlike the equivalent room at Sand Springs station, however, Room 1 was apparently not kept reasonably clean. The intensity of deposition is high, as would be found in a refuse zone. That is exactly what Burton observed in the living quarters at Butte station, where refuse was stowed under the bed along with tack, clothing, and feed sacks (Burton 1862: 469). One would be tempted to argue that the relative cleanliness in the living quarters at Sand Springs is due to the presence of a family at some time during its existence, while Cold Springs, like so many other pony express stations, was occupied entirely by men. And, on July 31, 1862, the emigrant Flora Isabella Bender noted in her diary:

...stopped at noon, watered and fed, and about five o'clock got to Sand Springs--salty water and no grass. Hay 5 cents per pound... A family lives at the station... We were invited in to dance this eve, but would not go. (Bender 1958: 171)

Unfortunately, the relationship between sex ratio and discard patterns on the western frontier has never been studied.

#### Room 2

The largest room in the station was used for a variety of

purposes, one of which may have been to store the haystack observed by Burton during his short visit (Burton 1862:487). There is no archaeological evidence of this activity, however, unlike the other activities of blacksmithing, horseshoeing, and refuse disposal. There is also geological evidence that a creek once flowed through the room, perhaps a diversion channel, as noted in the chapter on depositional processes. Supporting evidence for the activities identified include:

1. Horseshoe nails are concentrated in room 2.
2. A rectangular stone structure suggestive of a firebox for blacksmithing.
3. Charcoal, ash, and slag are concentrated in the room.
4. High diversity of artifact categories, suggesting a wide range of activities.
5. High intensity and diversity of artifacts just outside the doorway to the living quarters, suggesting refuse disposal.

### Room 3

The third room in a line from south to north was definitely used as a stable, and the east end was probably partitioned off and used as a storage area. Most of the evidence comes from soil chemistry and morphology, including:

1. Stratified deposits in the west end of the room that have the consistency, mottling, and layering of animal dung.
2. Chemical analysis of the deposits in this area show extremely high percentages of orthophosphates and total phosphorus,

diagnostic of the "organic pattern."

3. Two horseshoes were associated with these deposits.

4. By contrast, the east end of the room had neither stratified deposits nor the "organic" pattern of soil chemistry.

5. Artifact diversity and the intensity of deposition were low throughout.

#### Room 4

The northernmost room in the station had no archaeological deposits, with the exception of a few scattered artifacts lying on the ground surface. Patterns of soil chemistry are virtually the same as the natural deposits surrounding the station. Because of the crude construction of the room, it is tempting to think of it as a corral. At the same time, the soil chemistry does not support such an interpretation. Accordingly, its purpose will have to remain conjectural.

#### Outside

A one-meter wide trench was excavated outside the west of room 2, extending out 10 meters. The deposits in this zone have soil characteristics similar to those in the west end of room 3; they also have a high artifact diversity and intensity of occupation, suggesting that both kitchen refuse and animal manure were thrown here. That pattern of refuse disposal is similar to the one observed by Burton at Butte station and to the archaeological record at Sand Springs.

#### ACTIVITY PATTERNS AT SAND SPRINGS

The activity patterns at Sand Springs are virtually the same

as those defined for Cold Springs but with additional segregation of space into activity loci. There are rooms used for living quarters, storage and refuse disposal, general purpose, stables, and corrals. In addition refuse disposal zones occur just outside the walls, as well as in a foyer just outside the room used as living quarters.

#### Room 1

The living quarters at Sand Springs was divided into two rooms by a stone wall partition. Room 1 was the southernmost of the two and the only one to contain a fireplace, in the southwest corner. As previously noted, this room, and the other one making up the suite of living quarters, was marked by a very low intensity of deposition, suggesting that it was periodically swept or otherwise kept clean. Documentary evidence of a family operating the station, at least in 1863, adds support to that idea. Supporting evidence for the living quarters is as follows:

1. Architectural features such as a fireplace, plaster walls, and a wooden floor.
2. Low intensity of deposition.
3. Low artifact diversity but all artifact categories were associated with clothing (buttons, straight pins), adornment (beads), writing or weapons.
4. All but 5 percent of the faunal remains in the room were very small fragments, suggesting food consumption rather than preparation.

5. High bottle and weapons ratios.

#### Room 6

The room just north of room 1 also has archaeological evidence of having been used as a living quarters:

1. Low intensity of deposition.
2. Fragmented faunal remains suggestive of food consumption.
3. Most artifact categories used for clothing (buttons, shoes, textiles), grooming (hair comb), adornment (beads), writing, or weapons.
4. Architectural evidence such as heavily plastered walls and a wooden floor.
5. High bottle, button, and weapons ratios.

This room may have been used as a sleeping/storage area, following the pattern observed at Butte station by Burton.

#### Room 2

An L-shaped wall built just outside the entrances to the suite of living quarters and room 3 defines a space that may have been used as a foyer. The foyer, room 3, clearly separates an animal accommodation area (room 5) from the rooms used for domestic activities. It is possible that the foyer was used for storage but the only archaeological evidence is of refuse disposal, including:

1. High artifact diversity.
2. High intensity of deposition.
3. No architectural features of living quarters.
4. Heavy concentration of faunal remains.

5. High ratios of bottles, ceramic containers, and other kitchen refuse compared to the living quarters, suggesting that refuse had been dumped here.

### Room 3

The only other room with archaeological evidence of domestic activities is room 3, in the northwest corner. Unlike the suite of living quarters, however, room 3 was apparently an open "patio" used for blacksmithing, food preparation, and refuse disposal. In addition a stone-lined well was situated in the northeastern corner of the room, with some evidence of a windlass for hauling water. The supporting evidence for these activities include:

1. Very high ratio of ceramic containers.
2. High percentages of bottles and faunal remains.
3. Most of the utensils came from this room.
4. Slag and metal fragments were abundant.
5. High artifact diversity.
6. No architectural evidence of living quarters.

### Room 4

The largest room in the station is room 4, apparently used as a corral, for refuse disposal, and for butchering. Evidence from the archaeological record for these activities is as follows:

1. An "organic pattern" of soil chemistry.
2. Stratified deposits with the layering and mottling common to manure.
3. Very high intensity of occupation, most of which is caused

by the abundance of bone.

4. Large and non-meaty bone fragments suggestive of the early stages of butchering. (A more detailed discussion will follow in the chapter on Dietary Patterns.)

5. Low artifact diversity.

6. No architectural evidence of living quarters.

7. Large number of horseshoes, muleshoes, and ox shoes.

8. High bottle ratio, suggesting discard.

#### Room 5

The remaining room is an L-shaped stable and refuse disposal area, positioned between the corral and the living quarters via a foyer. Supporting evidence includes:

1. An "organic" pattern of soil chemistry.

2. Deep, stratified deposits with the layering and mottling characteristic of animal manure.

3. Relatively high ratios of bottles and ceramic containers, suggesting kitchen refuse thrown over the wall into the stable.

4. No architectural evidence of a living quarters

5. High intensity of deposition.

#### Outside

Refuse was dumped outside the walls at Sand Springs, forming a thin sheet similar to that at Cold Springs. The sheet was continuous around the building with two qualifications: (1) the intensity of deposition was highest outside the south wall where the doorways were placed; and (2) animal manure was thrown just

outside the north wall of the corral (room 4) and stable (room 5).

Supporting evidence for "dumping" activities is as follows:

1. High artifact diversity
2. Very high bottle ratio.
3. High intensity of deposition.

## DIETARY PATTERNS

The pony express stations were established to service a communications and transportation network, not to be self-sufficient communities. Because of this, and because they were situated on the unstable western frontier, access to supplies was a primary problem. In response Russell, Majors and Waddell set up an elaborate logistics system to support the stations and the express riders. According to Joseph Roberson, an agent in Saint Joseph:

In addition to the wages paid riders their board had to be provided as the country produced nothing whatever. Provisions were hauled by wagons from the Missouri River, Utah, and California (n.d., p.3).

The Mormon settlements around Salt Lake City and Carson Valley supplied Cold Springs and the other stations in Nevada. What kind of provisions were imported? At Butte Station in eastern Nevada, Sir Richard Burton observed "sacks of wheat, oats, meal, and potatoes" (1862:469). William H. Streeper, a carrier of "heavy mail" by mule, also mentions large sacks of grain in the Dry Creek station (Settle and Settle 1955). Hay was brought in by wagon, and Burton notes that haystacks were a prominent feature of most of the stations that he visited, including Cold Springs. Where there is hay, there is livestock, and horses, cattle, and sheep were also imported resources. Horses used in most of the Nevada pony express stations were wild mustangs from California.

Cattle and sheep were brought from Salt Lake City and Carson Valley. Sir Richard Burton dined upon steak when he visited Cold Springs (1862:487), but the written record gives no information about how important either beef or mutton was in the diet. The archaeological record is more informative. Both faunal and plant remains were recovered from Sand Springs and Cold Springs stations.

FAUNAL REMAINS<sup>1</sup>

Most of the archaeological evidence of diet at the two sites comes from the bony remains of animals, some of which show butchering marks, burning, or other evidence of having been used for food. Furthermore, the "sealed" deposits at Sand Springs station make it possible to study the spatial distribution of bone, from which butchering patterns and refuse disposal patterns can be inferred. The amount of bone recovered differed considerably. Only 373 elements were collected from Cold Springs station, but almost ten times that much (3171 elements) was present at Sand Springs. Since recovery procedures and preservation were virtually the same, the difference is probably due to (1) longer time span of occupation at Sand Springs; (2) a longer exposure at Cold Springs to scavengers; or (3) different disposal practices. Bone weathering is more apparent at Cold Springs than Sand Springs. Exposed bone still on the surface at the former site is the most

---

<sup>1</sup>This section is based upon Gifford (1976, 1977).

weathered but some buried bone is also weathered, suggesting that it lay on the surface for some time before being buried. The vast majority of bone at Sand Springs, by contrast, is in fresh condition and shows very little evidence of carnivore gnawing. That suggests that the refuse was buried in a very short time, probably within 6 months (Gifford 1977:75b). Another possibility is that the fresh bone was deposited in a covered area and not exposed to weathering. The much greater weathering of bone in the corral and in the refuse zone outside the station walls supports that interpretation. Viewed in that way, bone provides another kind of evidence that Sand Springs station was roofed.

#### The Menu

What kinds of animals were used for food? Tables 20 and 21 list the fauna taxa identified at the two sites. There are some distinct differences, although domestic animals clearly dominate the diet. Cow (Bos taurus) and sheep/goats (Ovis aries, Capra hircus, caprines unident.) are present at both sites, while pig (Sus scrofa) is present only at Sand Springs station. Their relative importance is uncertain. Cow appears to be the most important subsistence item at both sites if the total number of bones is used as an index. That conclusion is also supported by estimates of the minimum number of animal individuals represented by the bone at Sand Springs; however, all of the cow bones at Cold Springs station could have come from a single juvenile. Maybe Sir Richard Burton dined on the only cow that was ever eaten?

TABLE 20. FAUNAL INVENTORY AT SAND SPRINGS

<u>Taxon</u>	<u>Elements</u>	<u>Minimum Number of Individuals</u>
<u>Bos taurus</u>	311	6
Caprines*	65	5
<u>Sus scrofa</u>	11	2
<u>Equus caballus</u>	19	1
<u>Canis cf. latrans</u>	96	3
<u>Taxidea taxus</u>	236	1
Leporids (incl. <u>Lepus</u> )	187	5
Rodents (incl. <u>Citellus</u> )	100	7
Birds	25	3
Fish	5	1

\*Includes 3 definite Capra hircus individuals, diagnosed by horn cores.

TABLE 21. FAUNAL INVENTORY AT COLD SPRINGS STATION

TAXON	NUMBER OF ELEMENTS
<u>Bos taurus</u>	16
<u>Ovis aries</u>	2
<u>Odocoileus hemoinus</u>	1
<u>Artiodactyl</u> Indet.	10
<u>Lepus californicus</u>	27
<u>Sylvilagus nuttallii</u>	5
<u>Leporid</u> Indet.	23
<u>Cricetid</u> Indet.	6
Unidentified	<u>283</u>
TOTAL	373

Unlikely, but we can definitely conclude only at Sand Springs that cow was the major food on the menu. What about the remaining taxa? Rabbits (Lepus, Sylvilagus, leporids unident.) are abundant at both sites, but only at Cold Springs is there evidence of their having been used as food. Two tibias of young jack-rabbits recovered from the living quarters (room 1) have cutmarks, and a few other elements were stratigraphically associated with large animal remains having definite evidence of butchering. A single deer (Odocoileus hemionus) ulna from the same site supports the impression that wild animals were part of the diet. At Sand Springs, however, there is simply no evidence that wild animals were eaten, with the exception of 5 cranial bones of unidentified fish located both within and outside the stations walls. The station's propinquity to Carson Lake suggests the origin of the fish. Other animal taxa recovered from the sites are mostly rodents and wild carnivores (including a badger and at least 3 coyotes), none of which is likely to have been on the menu.

#### Butchering/Refuse Disposal Patterns<sup>2</sup>

Clues to the Station inhabitants refuse disposal practices at Sand Springs can be gained by examining the relative abundance of bones in different rooms and from the proportions of large and small bones. The rooms likely to have been the living area

---

<sup>2</sup>This section is reprinted from Gifford (1977:73-75a).

(Rooms 1, 6, 3) contained the fewest bones of any area on the site. Rooms 1 and 6, especially, were notable for their low frequencies of bone. Likewise, these two rooms had very few large animals' bones, as might be expected in a living area (Table 22). Only 5% of the bone in Room 1, and 4% of that in Room 6 came from large animals, and much of this was actually small scraps of larger bones. Medium sized mammals were also represented by rather low numbers of bones, comprising 15% of the Room 1 assemblage, and 10% of that in Room 6. The rest of the bone in both rooms derives from rodents, cottontails, and jack-rabbits, part of which may have been accumulated since the Station was abandoned. Room 3, which artifactual evidence indicates was used as a smithy and perhaps a cooking area, had higher -- but still modest proportions -- of medium-large mammal bones, together comprising 42% of the total for that room. Again, much of this bone was actually small scraps, rather than large whole bones. Room 1 yielded only 2.8% of bone with evidence of burning, Room 6, only 1.1%. In line with its possible culinary function, Room 3 yielded 6.8% burned bone.

The overall similarity of bone representation in Rooms 1 and 6 supports the argument that these are halves of a larger original room that was divided by a new wall later in the occupation.

Turning to the apparent entryway to the Station (Room 2), one sees a radically different pattern of refuse. This room undoubtedly has the highest density of bone per unit of floor

TABLE 22. NUMBER OF ELEMENTS PER TAXON (SAND SPRINGS STATION)

TAXON	1	2	3	4	out- side	5	6	TOTAL	%
<u>Bos</u>	1	17	7	189	30	66	1	311	10
<u>Caprine</u>		15	2	6		42		65	2
<u>Sus</u>			6			5		11	0.5
M. Artiodactyl	1	68	18	24	15	15		141	4
<u>Equus</u>					1	18		19	1
<u>Canis</u>			6	7	14	35	34	96	3
Taxidea					236			236	7
Leporids (t)	32	33	50	3	25	5	39	187	6
Rodent (t)	47	11	11	1	25	1	4	100	3
L. Mammal	7	75	72	225	298	66	10	753	24
M. Mammal	25	212	33	16	65	59	26	436	14
S. Mammal	50	67	21	6	46	27	111	328	10
Mammal Size Indet.	2	179	96	7	66	79	29	458	14
Bird	8	6	4		4	1	2	25	1
Fish	1	1			3			5	0.5
TOTAL	174	684	326	484	828	419	256	3171	

Medium Artiodactyl = bones of Odocoileus - caprine - Sus size range

Large Mammal = bones of approximate size of Equus, Bos

Medium Mammal = bones of approximate size of Odocoileus, caprines,  
Sus, lg. Canis

Small Mammal = bones of approximate size of leporids or large rodent  
(small rodent bones assigned to "Rodent" taxon).

area of any room at the site. Furthermore, if one subtracts the 236 bones of the young badger from the bone tally for outside the station, one sees that the entryway also contains the greatest number of bones clearly attributable to the human occupation. In contrast to Rooms 1 and 6, medium-large mammal bones here make-up over half the total (56%) bone, though much of this is broken-up scrap. In all, the bone assemblage here corroborates the inference drawn from the high artifact densities in the same room -- the Station's occupants had a penchant for tossing their trash no farther than the door of their living quarters. Room 2 yielded 5.5% bone with evidence of burning.

The probable stable (Room 5) is again very different in its constitution than the living area. Here, many large animal's bones were recovered. Fully 70% of the bones excavated from this area belonged to medium-large mammals, with a substantial fraction so little broken that they could be identified as cattle (17%) or caprines (11%).

A similar pattern holds for the probable corral area (Room 4), but to an even greater degree. Large mammal bones by themselves total 85% of the assemblage collected here, identifiable Bos elements being 39% of the total. Medium mammal bones amount to 9%, forming together with the large elements the overwhelming majority of the assemblage.

In both the stable and corral areas, bone with traces of burning was very rare (0.4% and 0.8%, respectively). This contrasts with Rooms 3 and 2, and with the perimeter zone, where it was relatively more abundant. This reflects a pattern of bone in these pens somewhere in the butchery process prior to cooking. The relatively high numbers in these two areas of bones of the lower leg and other meat-poor elements usually discarded by Americans may also be explained in this fashion. Large and medium animals may actually have been butchered in the corral, since such bones as are normally early discards occur within its walls.

Some evidence points to repeated and habitual use of the corral as a refuse disposal site for large animals' bones. Ankle and foot bones of 3 different cattle, each at a slightly different stage of maturation, were found closely associated in part of the corral area.

The outside refuse zone, extending out 10 m around the perimeter of the building, yielded the greatest number of bones, if one includes the numerous elements contributed by the young badger carcass. If one subtracts this individual's bones, one can see that large mammal bones are abundant in this zone also (55%), but less so than in the corral area. One of the most striking features of this zone is the high proportion (18.6%) of bone with traces of burning. About 3 times the highest frequency found inside the station, this may indicate habitual dumping of larger bones out-

side the station after cooking.

While remaining unverified speculation at present, a plausible explanation of the differing bone refuse patterns found in the various rooms of the Station is that animals were slaughtered and underwent primary butchery in the corral where meat-poor cuts were discarded. Cuts were then cooked in the living area, and leftover bones were habitually dumped in either the entry-way or around the perimeter of the building.

#### PLANT REMAINS

The only plant remains recovered were from Sand Springs. Table 23 lists the finds by species, frequency, and provenience. The largest number of elements is nut shells from the single-leaf pinyon pine (Pinus monophylla). Pinyon does not grow in the vicinity of the site and must have been brought in from the higher mountain ranges several miles south. The pinyon nut was an important source of protein for the indigenous Paiutes and the nut shells recovered may be associated with an Indian occupation; however, the nut also became a popular luxury item for Euroamericans living in the Comstock area and its use by station attendants here is not unexpected. The second largest number of plant remains is from fourwing salt brush (Atriplex canescens), a native plant common to the area today as well as during Capt. Simpson's exploration. It is unlikely that the plant was used as food or for other economic purposes, except perhaps as firewood. The pits of peaches (Prunus persica) were

TABLE 23. PLANT REMAINS FROM SAND SPRINGS STATION

SPECIES	PROVENIENCE	NUMBER
Shells from Pinyon Pine Nut ( <u>Pinus Monophylla</u> )	4-12N1E-1	1 Fragment
	102	9 Fragments
	112	15 Fragments
	6B3	1 Complete
Seeds from Fourwing Saltbrush ( <u>Atriplex canescens</u> )	Room 4	1
	2N3	14
	505	3
	5M5	1
Peach Pits ( <u>Prunus persica</u> )	3B2	1 Complete
	2D4	4 Fragments
	112	1 Complete
Beans ( <u>Phaseolus vulgaris</u> )	1C3	3 Fragments

also present, an obvious food item and one that was usually imported from either the Washoe Valley or California. Finally, three charred fragments of common beans (Phaseolus vulgaris) were recovered from Room 1, probably a small white or pink bean. The occurrence of the beans in the room with the fireplace adds support to the "commonsense" interpretation that they were used as food.

## ASSESSING SIGNIFICANCE

We excavated Cold Springs station and Sand Springs station for particularistic reasons: site identification, the mitigation of visitor impact, and filling in details about life in a pony express station. Most archaeological studies done under the auspices of federal and state cultural resource management programs will have similar goals. The thrust of this report is, accordingly, aimed at answering such questions as who occupied the stations, when they were there, and what they did. Little attention has been given to the significance of the sites to general archaeological research or to the public at large; yet the evaluation of significance is the key to the management of archaeological sites on public lands. The purpose of this final chapter is, therefore, to consider questions of significance that may be of use to the land manager.

### SIGNIFICANCE TO THE LAY PUBLIC

What is the value of a pony express station to the general public? At least three can be identified: recreational value, symbolic value, and educational value. The first of these is probably best known and most easily measured. Americans are notorious for their leisure time and love of travel; a pony express station is a recreational "magnet" that attracts visitors in the same way that any other public landmark does. It attracts visitors, one suspects, not just because it has special meaning to the American public but because it is there. If that is true,

the frequency of visitations should increase with the density. That is, if a visitor is in the vicinity, the station is likely to be visited simply because it is marked and accessible. Whatever the reason for visits, the recreational value of the pony express stations can be measured in visitor days.

The symbolic value of a pony express station has to do with the American love of the "western frontier" and the expansion of American civilization into the West. Few historical events on the frontier are better known in the public mind than the pony express; it represents a romantic era of the past. And it is this imagery that creates the symbolic value of Cold Springs and Sand Springs stations. That imagery is enhanced by archaeological and documentary reconstruction of the activities taking place at pony express stations, its architectural details, food habits, and the like; that was, of course, the principle reason for our research. But the image of the pony express is not always positive. We often forget about the destruction brought upon native Americans by encroaching American civilization, and the pony express station is a symbol of that destruction. For native Americans, then, the symbolic value is negative. Whatever the final management plan will be, both the positive and negative values must be considered.

The educational value of a pony express station is closely linked to its symbolic value. What kind of experience should the visitor have? Is the station to portray a strictly positive, romantic image of the expansion of American civilization? Or

should a more balanced image be presented, giving a more realistic interpretation? The latter is strongly recommended.

Measuring the symbolic value of a pony express station is not easy. Probably the best way of doing it is through a content analysis of educational and popular literature to get an idea of how the pony express in general is portrayed and how often it is given as an example of life on the western frontier. Management decisions can then be made about the need to change that image at the pony express station exhibits to more closely correspond with historical reality.

#### ARCHAEOLOGICAL SIGNIFICANCE

The significance of Cold Springs station and Sand Springs station as archaeological sites is measured by the extent to which they help reach goals and answer questions of agreed-upon importance to the archaeology and the history of the region. And those goals and questions have yet to be identified, suggesting what direction our efforts must take if we are going to properly manage these, and similar, historic sites. Let us consider for a moment what research goals are most likely to affect the archaeological significance of the two pony express stations.

Both sites are part of a thrust by 19th century American civilization into a new territory; they are, therefore, possible clues to the process of expansion and adaptation to new environments that has marked the rise of all civilizations. Two kinds of questions come to mind. The first has to do with the particular

roles played by Cold Springs and Sand Springs in a communications/ transportation network linking the American heartland and its western frontier. In what ways are these stations the same as the tambos of the Inca empire, for example? Both had the same roles in maintaining a communications network, were situated in remote areas, and were supplied by a central organization. Perhaps pony express stations, along with tambos, have archaeological records that are useful in the construction and verification of general models of way stations linked into a communications system?

But the contribution of Cold Springs and Sand Springs to our understanding of the frontier process is an even better way to evaluate their archaeological significance. The frontier is more than a place where human activities and events happen; it is also a set of rules, a process, for transforming a "wilderness" into civilization (Billington 1963). And the pony express station can be usefully viewed as a frontier colony that is involved in that transformation.

The frontier process can be at least partly understood by systems of interaction between the homeland and the frontier colonies. Thus, Cold Springs and Sand Springs must be viewed as participating, to a greater or lesser extent, in regional and national networks; they are not isolated households. One kind of network is economic. The process of transformation, or stages thereof, can be traced through the circulation of goods and services; in the classic model of frontier-homeland interaction,

the circulation is "vertically specialized:" raw materials flow from the frontier to the homeland and manufactured goods and services flow in the opposite direction (Lewis 1977). That is what would be expected for early mining communities on the American western frontier, for example, but another model may be more accurate for other settlement. What kind of transformations in economic participation accompany the frontier process? Adams (1976) has given data from the state of Washington suggesting what some of the changes may be, but we are barely beginning the search. And that can lead to a large number of questions that can be used to assess the archaeological significance of Cold Springs and Sand Springs.

The degree to which colonies "participate" in a frontier-homeland system, however, is not entirely reflected by economic ties. We all know of instances in which luxuries and other commodities are adopted by societies with little, if any, acceptance of cultural rules of behavior. Thus, cultural pluralism can exist within a well-integrated economic system. In this regard, Baker (1978) has pointed out the usefulness of studying the extent to which the Colorado mining frontier participated in Victorian Culture, the dominant culture of American Civilization during the 19th century. And that system of participation suggests another way in which the frontier process can be studied. According to social historians, Victorian Culture was rooted in the urban middle-class of Britain and the United States but had strong manifestations throughout

America (Howe 1976). The rules stressed "protestant religious beliefs, literacy, compulsive behavior stressing an ethic of steady work and punctuality, Whig/Republican political orientation, temperance, emphasis on rational order in individual and society behavior, humanistic self-cultivation and self-denial of physical or mental excesses, emphasis on efficient use of time, conspicuous consumption, individual self-righteousness, emphasis upon natural laws of moral principles, and didacticism" (Baker 1978: 13, after Howe 1976). "Didacticism," a feeling of moral superiority and cultural competitiveness, is the key to understanding why the "carriers" of Victorian Culture sought so aggressively to assimilate those individuals and societies carrying other cultural rules (Howe 1976). It is clear that Victorian Culture played a major role in the 19th century transformation of rural American into an industrialized urban society (ibid.), and its role in the "frontier process" cannot be overstated. Another measure of the interchange between frontier and homeland, then, is the degree to which frontier settlements participated in Victorian Culture. Changes in that participation are tied to the frontier process and can be studied archaeologically to the extent that the rules of Victorian Culture are manifested in material culture. Appropriate research strategies will have to place a strong emphasis upon the "meaning" of material culture in Victorianism, an approach being used by Leone (1973) in the study of Mormonism. The cultural context of materials has not been studied by western historians, for the most part; if historic

sites archaeologists are to take full advantage of their data base,  
they will have to fill the gap.

## LITERATURE CITED

- Adams, William  
1976 Trade Networks and Interaction Spheres: A View from Silcott, Historical Archaeology 10: 99-112.
- Ajax, William  
n.d. Diary, Manuscript on file in the University of Utah Library, Salt Lake City.
- Angel, Mryon (Editor)  
1958 History of Nevada 1881 with Illustrations and Biographical Sketches of its Prominent Men and Pioneers, Thompson and West, Oakland, California: reprint edition, Howell-North, Berkeley, CA.
- Baker, Steven G.  
1978 Historical Archaeology for Colorado and the Victorian Mining Frontier: Review, Discussion, and Suggestions, Southwestern Lore, 44: 11-31.
- Bender, Flora Isabella  
1958 Memoranda of a Journey across the Plains, from Bell Creek, Washington Co., Neb. to Virginia City, Nevada Terr. May 7 to August 4, 1863, Nevada Historical Society Quarterly 1: 171.
- Billington, Ray  
1963 The Frontier in American Thought and Character, In The New World Looks at its History, edited by A.R. Lewis and T.F. McGann, University of Texas Press, Austin.
- Burton, Richard  
1862 The City of the Saints, and Across the Rocky Mountains to California, A.A. Knopf, New York.
- Chapman, A.  
1932 The Pony Express, the Record of a Romantic Adventure in Business, J.P. Putnam's Sons, New York.
- Chorpenning, George  
1874 The Case of George Chorpenning vs the United States: A Brief History of the Facts by the Claimant, McGill and Witherow, Washington, D.C.
- Cody, William F.  
1879 The Life of Hon. William F. Cody, known as Buffalo Bill, the Famous Hunter, Scout, and Guide, an Autobiography, F.E. Bliss, Hartford, Conn.

- Conkling, Roscoe P. and Margaret B. Conkling  
1947 The Butterfield Overland Mail 1857-1869, 2 volumes, The  
Arthur H. Clark Company, Glendale, Calif.
- Elliott, Russell R.  
1971 History of Nevada, University of Nebraska Press, Lincoln.
- Fontana, B.L. and J.C. Greenleaf  
1962 Johnny Ward's Ranch: A Study in Historic Archaeology,  
The Kiva, 28(1-2).
- Garavaglia, L.A. and C.G. Worman  
1977 Frontier Forts Counted on Minie, The American Rifleman  
(April, 1977), pp. 32-34.
- Gifford, D.P.  
1976 Faunal Remains, In Archaeology of Cold Springs Pony Express  
Station, by Donald L. Hardesty, pp. 107-111, Carson District,  
Nevada, Bureau of Land Management, Carson City, Nevada.  
1977 Faunal Remains, In Archaeology of Sand Springs Express  
Station, by Donald L. Hardesty, pp. 71-75b, Carson District,  
Nevada, Bureau of Land Management, Carson City, Nevada.  
1978 Ethnoarchaeological observations on Post-occupation Processes  
and the Problem of Archaeological Visibility, In Explorations  
in Ethnoarchaeology, edited by R. Gould, University of New  
Mexico Press, Albuquerque.
- Godden, Geoffrey A.  
1964 Encyclopedia of British Pottery and Porcelain Marks,  
Crown Publishers, New York.
- Hardesty, Donald L.  
1978a Historical and Archaeological Investigations of the Rock  
Creek Stage and Telegraph Stations, Carson District, Nevada,  
Bureau of Land Management, Carson City, Nevada.  
1978b Historical, Architectural, and Archaeological Studies of  
Fort Churchill, Nevada, Nevada Division of State Parks, Carson  
City, Nevada.
- Hafen, L.  
1926 The Overland Mail 1849-1869, A.H. Clark Company, Cleveland
- Howe, Daniel W.  
1976 Victorian Culture in America, In Victorian America, edited  
by Daniel W. Howe, pgs. 3-28, University of Pennsylvania Press,  
Philadelphia.

Johnson, L.R., Jr.

1968 Item Seriation as an Aid for Elementary Scale and Cluster Analysis, Bulletin No. 15, Museum of Natural History, University of Oregon, Eugene.

Kidd, Kenneth E. and Martha Ann Kidd

1970 A Classification System for Glass Beads for the Use of Field Archaeologists, Canadian Historic Sites: Occasional Papers in Archaeology and History, Number 1, pp. 45-89, National Historic Sites Service, National and Historic Parks Branch, Department of Indian Affairs and Northern Development, Ottawa, Canada.

Kirk, M.A.

1976 Buttons from the San Buenaventura Mission Site, 1975, In The Changing Faces of Main Street: Ventura Mission Plaza Archaeological Project, edited by Roberta S. Greenwood, pp. 369-415, Redevelopment Agency, City of San Buenaventura, California.

Lee, William

1859 Overland Journey from Washington, D.C. to Genoa, Carson Valley, Utah and Return, with Captain J.H. Simpson, manuscript on file in the Utah State Historical Society, Salt Lake City, Utah.

Leone, Mark

1973 Archaeology as the Science of Technology; Mormon Town Plans and Fences, in Research and Theory in Current Archaeology, edited by Charles Redman, John Wiley, New York.

Lewis, Kenneth

1977 Sampling the Archaeological Frontier: Regional Models and Component Analysis, In Research Strategies in Historical Archaeology, edited by Stanley South, pp. 151-201, Academic Press, New York.

Lorrain, Dessamae

1968 An Archaeologist's Guide to Nineteenth Century Bottle Glass, Historical Archaeology 2: 35-44.

Majors, Alexander

1893 Seventy Years on the Frontier, Ross and Haines, Minneapolis, Minn.

Moore, Jackson W., Jr.

1963 Bent's Old Fort, State Historical Society of Colorado and the Pruett Publishing Company, Denver, Colorado.

Noble, W.C.

1973 The Excavation and Historical Identification of Rocky Mountain House, Canadian Historic Sites: Occasional Papers in Archaeology and History 6: 56-163, Ottawa, Canada.

Nonte, George C., Jr.

1974 Home Guide to Muzzle Loaders, Stackpole Books, Harrisburgh, Penn.

Richardson, J.B. and K.C. Wilson

1976 Hannas Town and Charles Foreman: the Historical and Archaeological Record, Western Pennsylvania Historical Magazine 59(2).

Roberson, Joseph

n.d. Extracts from Articles Written on the Pony Express, Manuscript on file at the Bancroft Library, University of California, Berkeley.

Rumfield, Hiram S.

1929 Letters of an Overland Mail Agent in Utah (edited by A.B. Hulbert), Proceedings of the American Antiquarian Society for October 1928.

Russell, C.P.

1957 Guns on the Early Frontier, University of California Press, Berkeley.

Schiffer, M.B.

1976 Behavioral Archaeology, Academic Press, N.Y.

Settle, R.W. and M.L. Settle

1955 Saddles and Spurs, The Pony Express Saga. The Stackpole Company, Harrisburg, Penn.

Simpson, J.H.

1876 Report of Explorations Across the Great Basin of the Territory of Utah, Engineer Department, U.S. Army, Government Printing Office. Washington, D.C.

Smith, Waddell F. (Editor)

1960 The Story of the Pony Express, Hesperian House, San Francisco.

South, Stanley

1972 Evolution and Horizon as Revealed in Ceramic Analysis in Historical Archaeology, Conference on Historic Site Archaeology, Papers 6: 71-116.

1977 Method and Theory in Historical Archaeology, Academic Press, New York.

Stone, L.M.

1974 Fort Michilimackinac 1715-1781, Publications of the Museum, Anthropological Service Volume 2, Michigan State University, East Lansing, Michigan.

Swannack, J.D. (Editor)

1973 Archaeological Excavation Manual, National Historic Sites Service, National and Historic Parks Branch, Department of Indian Affairs and Northern Development, Ottawa, Canada.

Switzer, R.R.

1974 The Bertrand Bottles: A Study of 19th Century Glass and Ceramic Containers, National Park Service, Washington, D.C.

Thompson, Robert L.

1947 Wiring a Continent: The History of the Telegraph Industry in the United States 1832-1866, Princeton University Press, Princeton, J.J.

Thorn, C. Jordan

1949 Handbook of American Silver and Pewter Marks, Tudor Publishing Company, New York.

Toulouse, Julian H.

1971 Bottle Makers and Their Marks, Thomas Nelson, Inc., New York.

Wheat, Carl I.

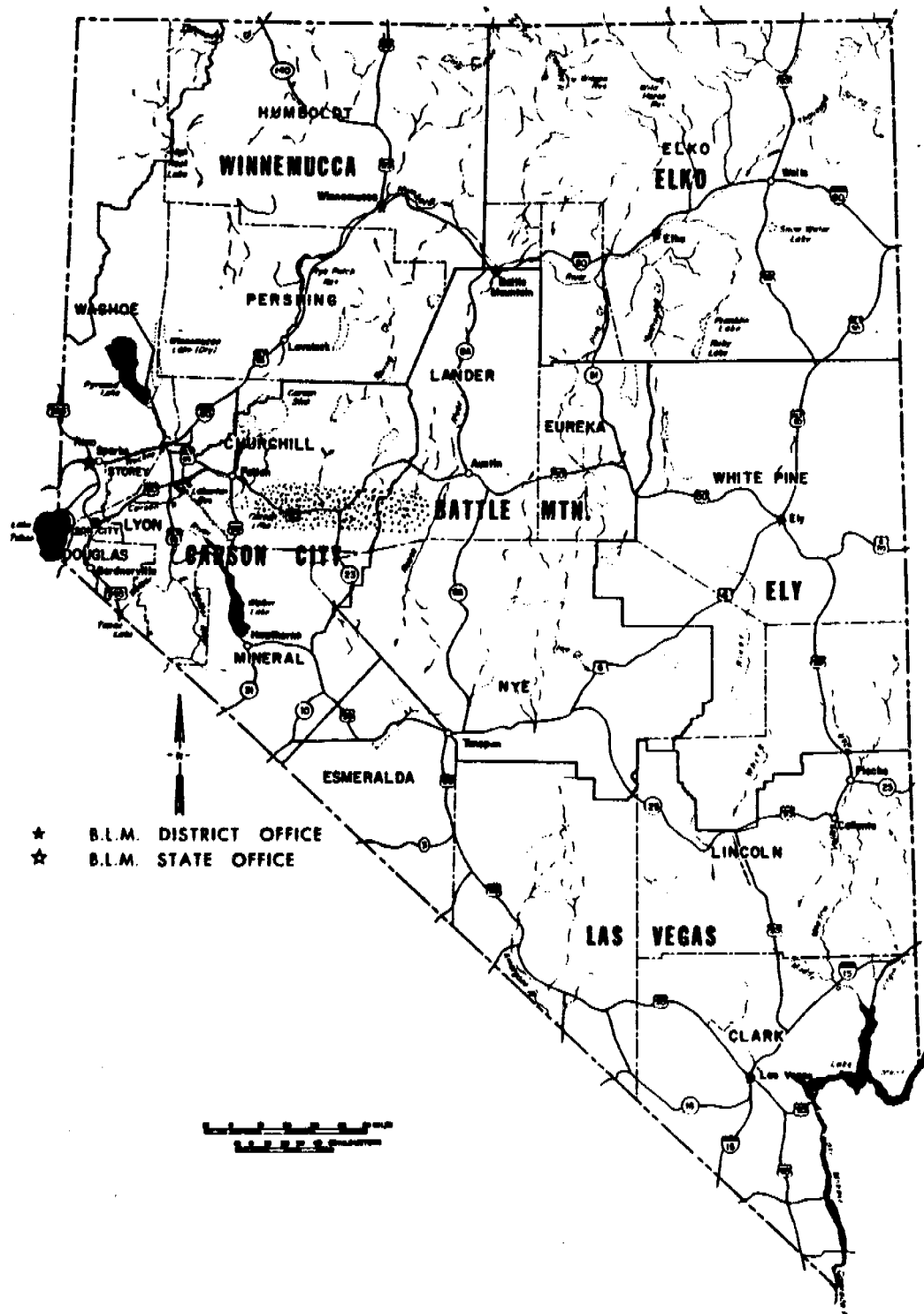
1963 1540-1861 Mapping the TransMississippi West, 5 volumes, The Institute of Historical Cartography, San Francisco.

Wilson, Rex L.

1961 Clay Tobacco Pipes of Fort Laramie, Annals of Wyoming 33: 121-134.

NSO PUB. 16 (2/80)

\* U. S. GOVERNMENT PRINTING OFFICE 1980 - 682-702/214 Reg. 8



NEVADA

OBC